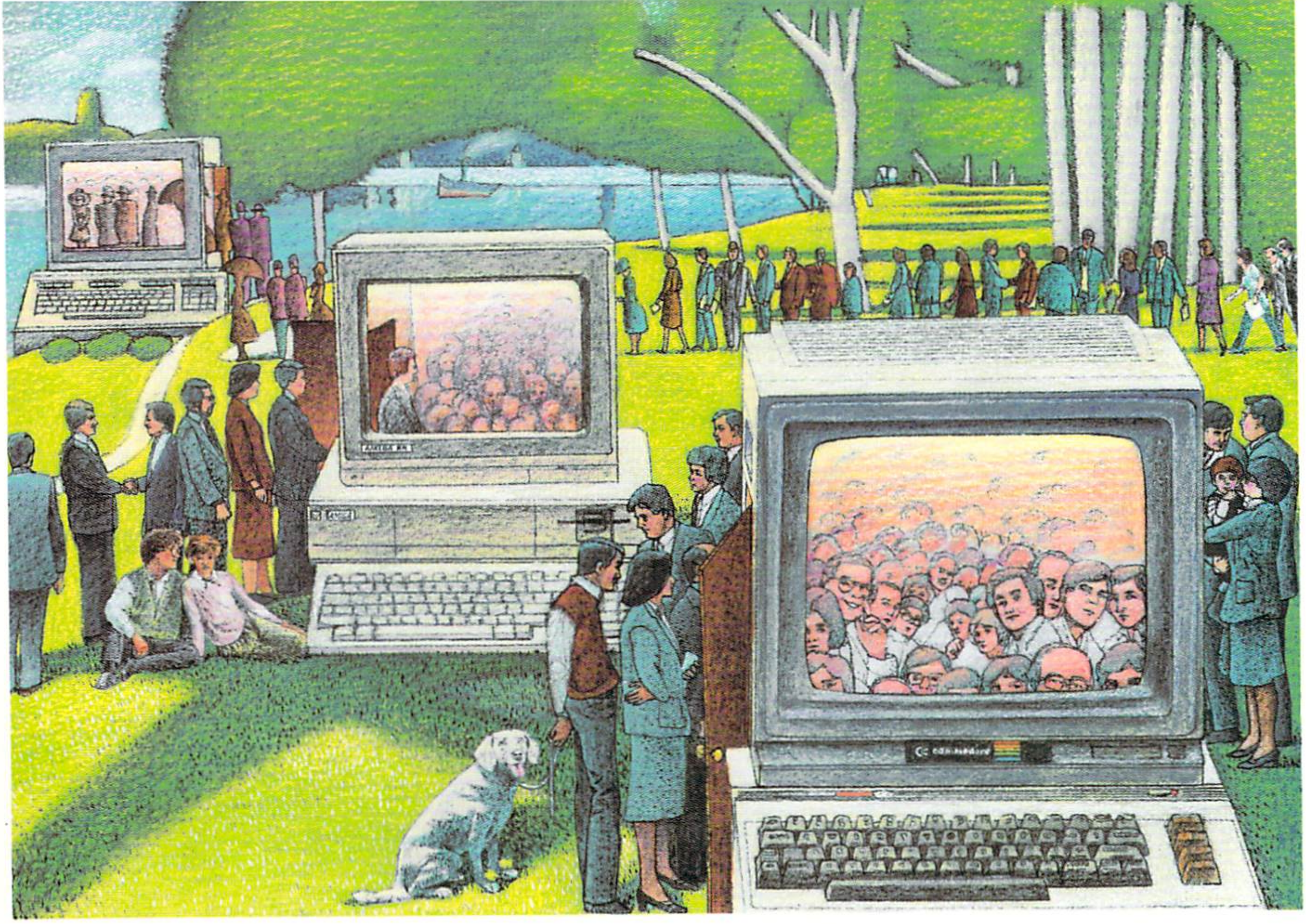
COMMODORE USERS

# Ahoy!

$2.75/ CAN. $3.25 NOV. 1986

48355 K






# USE THE BRAINS YOUR COMMODORE WASN'T BORN WITH.

## Right at Your Fingertips in CompuServe's Commodore® Forums

Our Commodore Forums involve thousands of Commodore users worldwide. These forums show you just how easy and fun it is to get the most from your Commodore Computer.

The Commodore **Communications Forum** provides the latest news on communications software and advice on effective telecommunications.

The Commodore **Programming Forum** supports programmers and developers of Commodore 8-bit computers.

The Commodore **Arts and Games Forum** is for all Commodore 8-bit computers, concentrating on music, graphics and games.

The Commodore **Amiga® Forum** is the national resource for all business and entertainment applications in the Amiga community.

**Easy access to free software, including FREE uploads.**

- *Download first-rate, non-commercial user-supported software and utility programs.*
- *Upload your own programs free of connect time charges.*
- *Take advantage of CompuServe's inexpensive weeknight and weekend rates (when forums are most active, and standard online charges are just 10¢ a minute).*
- *Go online in most major metropolitan areas with a local phone call.*
- *Receive a* ***$25.00 Introductory Usage Credit*** *when you purchase your CompuServe Subscription Kit.*

**Information you simply can't find anywhere else.**

Use the Forum *Message Board* to exchange mail with fellow members. Join ongoing, real-time discussions in a Forum *Conference*—with Commodore software publishers, developers and technical experts. Scan Forum *Data Libraries* for free software, documentation and contributions from Commodore enthusiasts.

Enjoy other useful services, too. Like electronic editions of your favorite magazines, newsletters and articles, including Family Computing, OMNI Online and the Electronic Gamer.™

**All you need is your Commodore computer and a modem...or almost any other personal computer.**

To buy your Subscription Kit, see your nearest computer dealer. Suggested retail price is $39.95. To receive our free brochure, or to order direct, call 800-848-8199 (in Ohio, call 614-457-0802). If you're already a CompuServe subscriber, type GO CBMNET (the Commodore Users Network) at any ! prompt to see what you've been missing.

**CompuServe®**

Information Services, P.O. Box 20212
5000 Arlington Centre Blvd., Columbus, Ohio 43220

**800-848-8199**

In Ohio, call 614-457-0802
An H&R Block Company

Reader Service No. 144

# Ahoy!

## CONTENTS

### DEPARTMENTS


**A View from the Bridge**...*of the November issue of* Ahoy! 7

**Scuttlebutt**...*Commodore's in the black, and we're anything but blue.* 8

**Reviews**...*another tour de force by Morton Kevelson—and a partner.* 58

**S.O.S.**...*a life saver for the floundering programmer.* 69

**Tips Ahoy!**...*the most extensive installment to date!* 78

**Commodares**...*the monthly mindbenders for* Ahoy! *aces.* 89

**Flotsam**...*a few selections from the* Ahoy! *mailbag.* 116

**Program Listings**...*we pack 'em in for your keypunching pleasure.* 119


### FEATURES


**Rupert Report: Tons of Data** *by Dale Rupert** 20

**Commodore Roots: The Shadow Knows** *by Mark Andrews*** 27

**Entertainment Software Section** *(contents on page 41)* 41

**Cadet's Column: PROMAL** *by Cheryl Peterson**** 95


*Includes programs: *Datawriter* and *Datareader* (for the 64 and 128)

**Includes program: SPRITE1 (for the C-128)

***Includes program: *Self-Addressed Labels* (PROMAL required)

### PROGRAMS


**Teleporter** *for the C-64 by Cleveland M. Blakemore* 35

**Deluxe List** *for the C-64 by Mark Bersalona* 36

**128 RAM Check** *by Buck Childress* 39

**Syntax Patrol** *for the C-64 by Buck Childress* 52

**Discs of Daedalus** *for the C-64 by George Decker* 55

**Detonation** *for the C-64 by Bob Blackmer* 56

**Long Lines** *for the C-64 by Rick Nash* 73

**Guardian** *for the C-64 by Cleveland M. Blakemore* 74

**Tenpins** *for the C-64 by Tony Brantner* 77

**Bug Repellents** *for the C-64 and C-128 by Kleinert & Barron* 120

**Flankspeed** *for the C-64 by Gordon F. Wheat* 121


**Cover art by James Regan and Ajin**


**Publisher**
*Michael Schneider*

**Editor**
*David Allikas*

**Art Director**
*JoAnn Case*

**Managing Editor**
*Michael R. Davila*

**Senior Editors**
*Tim Little*
*Tim Moriarty*

**Technical Editors**
*David Barron*
*Bob Lloret*

**Consulting Editors**
*Ben Bova*
*Morton Kevelson*
*Dale Rupert*

**Entertainment Editor**
*Arnie Katz*

**Production Director**
*Laura Pallini*

**Art Production**
*Christopher Carter*
*Mark Kammerer*
*Victoria Green*

**Bulletin Board SYSOP**
*B.W. Behling*

**Circulation Director**
*W. Charles Squires*

**Advertising Director**
*Lynne Dominick*

**Director of Promotion**
*Joyce K. Fuchs*

**Controller**
*Dan Tunick*

**Managing Director**
*Richard Stevens*

**Advertising Representative**
*JE Publishers' Representative*
*6855 Santa Monica Blvd., Suite 200*
*Los Angeles, CA 90038*
*(213) 467-2266*
*Boston (617) 437-7628*
*Dallas (214) 660-2253*
*New York (212) 724-7767*
*Chicago (312) 445-2489*
*Denver (303) 595-4331*
*San Francisco (415) 864-3252*

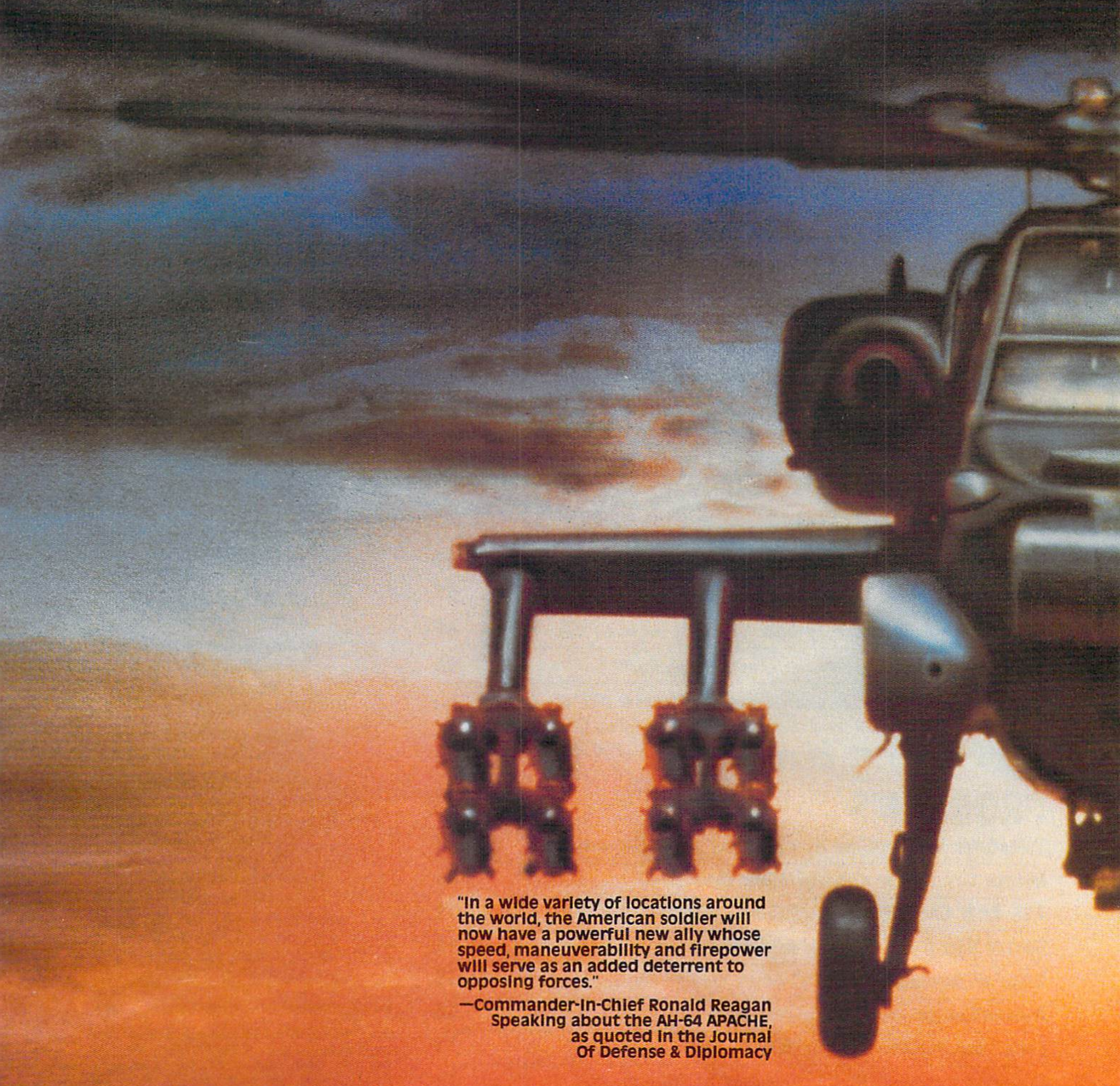
ISSUE NO. 35 NOVEMBER 1986

*Ahoy!* (ISSN #8750-4383) is published monthly by Ion International Inc., 45 W. 34th St., Suite 407, New York, NY, 10001. Subscription rate: 12 issues for $21.95, 24 issues for $41.75 (Canada $29.25 and $54.25 respectively). Second class postage paid at New York, NY 10001 and additional mailing offices.


© 1986 by Ion International Inc. All rights reserved. © under Universal International and Pan American Copyright conventions. Reproduction of editorial or pictorial content in any manner is prohibited. No responsibility can be accepted for unsolicited material.


Postmaster, send address changes to *Ahoy!*, 45 W. 34th Street, Suite 407, New York, NY 10001. Direct all address changes or matters concerning your subscription to *Ahoy!*, P.O. Box #341, Mt. Morris, IL 61054. All editorial inquiries and software and hardware to be reviewed should be sent to *Ahoy!*, 45 W. 34th St., Suite 407, New York, NY 10001.

# 21st CENTURY WARRIOR:



"In a wide variety of locations around the world, the American soldier will now have a powerful new ally whose speed, maneuverability and firepower will serve as an added deterrent to opposing forces."

—Commander-in-Chief Ronald Reagan Speaking about the AH-64 APACHE, as quoted in the Journal Of Defense & Diplomacy

The APACHE—as fierce and elusive as its warrior namesake. Equipped with an arsenal of today's most advanced weaponry, it can attack from nowhere against overwhelming odds, then slip away to strike again without warning. It is capable of defeating the enemy's armored columns, infantry and, if necessary, hostile aircraft on the modern electronic battlefield.

The attack helicopter—the gunship—came of age during the Vietnam War. Starting as a primitive patchwork of machine guns and rocket pods straped to the side of a utility helicopter, it evolved into such sophisticated weapon systems as the armed Huey and AH-1G Cobra. However, the deadly armored arsenal of today's Warsaw Pact demands an even stronger front line.

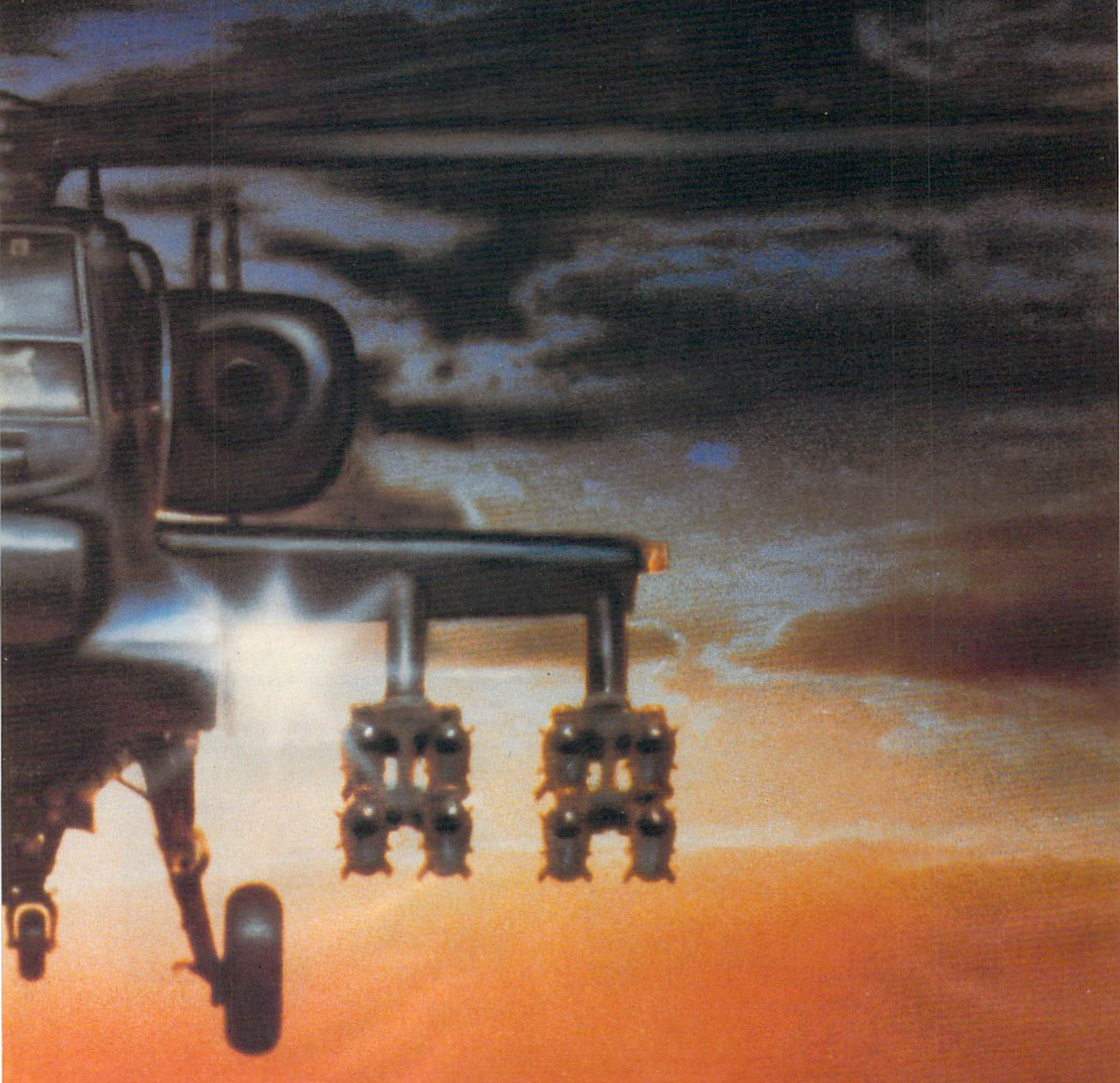
The AH-64 Apache is here to give America all the muscle it needs for the defense of freedom. This war machine is a fully integrated acquisition/firepower system designed to let the pilot find, lock onto and destroy the enemy with the greatest possible accuracy and effectiveness. Now actively in production at Hughes Helicopters, the first 675 choppers should be delivered to the U.S. Army by early 1990.

But you don't have to wait. As the latest addition to the ever growing line of MicroProse Simulation Software, GUNSHIP now brings all of the danger and excitement of attack helicopter action home to your computer in this true-to-life simulation.

With GUNSHIP, you, the pilot, will fly confidently into the world's hottest trouble spots... Central America, the Middle East, Southeast Asia and Central Europe. You'll use an unbelievable array of

# Apache GUNSHIP™

THE ATTACK HELICOPTER SIMULATION



high-tech information and weapons systems to get the job done including lasers, video cameras, night viewers, radar warnings, jammers, computers, missiles, rockets, flares and a 30mm cannon! Successful missions will be rewarded with medals and rank promotions; build your career as you go!

All of the GUNSHIP action is presented in revolutionary 3-D graphics. The cockpit instrumentation is elaborate; the maps, stores and damage displays are extensive; all flying maneuvers are fully accurate. A comprehensive Operations Manual and keyboard overlay complete the package.

See your software dealer today and become a part of the GUNSHIP adventure! Challenge the enemy, the sky, and YOURSELF with this extraordinary simulation.

**Reader Service No. 145**

GUNSHIP. For Commodore 64/128 and Atari XL/XE computers at a suggested retail of $34.95; also for Apple II Family, IBM PC/PC Jr., Tandy 1000, Atari ST and Amiga at $39.95. Call or write for specific machine availability, and for MC/VISA orders if product not found locally.

COMMODORE, ATARI, APPLE, IBM, TANDY AND AMIGA are registered trademarks of Commodore Electronics Ltd., Atari Inc., Apple Computer Inc., International Business Machines Corp., Tandy Corp., and Commodore-Amiga Inc., respectively.

MICRO PROSE™

SIMULATION • SOFTWARE

120 Lakefront Drive • Hunt Valley, MD 21030 • (301) 771-1151

# Have your Commodore® look as smart as it works.



## Consolidate your 64, 64C and 128 system with the Command Center.



With the Command Center, your system is compact and complete.

### Get your workspace back again.

The Command Center will untangle your wires, unclutter your desk and put peripherals at your fingertips. Condensing your whole system into one compact unit, you might consider it the **ultimate** Commodore peripheral. You get Commodore value with the look of a more expensive system.

### Just look at all it includes:

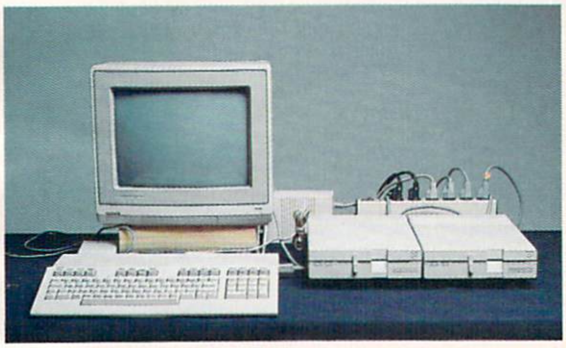
■ **Built-in AC Power Strip** with power surge and voltage spike protection, line noise filtering and power outlets.

■ **Built-in Drive/CPU Cooling Fan** to prevent overheating.

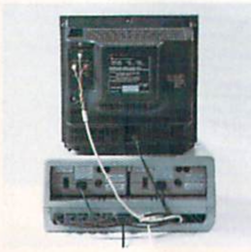
■ **Modular Telephone Plug**, with its own on-line/off-line telecommunications switch. (Option on 64 and 64C).

■ **Master AC Switch** for easy system power-up.

■ **Single or Dual Drive Configurations** with the standard drive insert.



Without the Command Center your Commodore peripherals look cluttered and take up most of your desk top.





Many built-in conveniences add to the Command Center's value.

®Commodore is a registered trademark of Commodore Electronics Ltd.

**KETEK**

**Free 30-day trial offer** and one-year warranty.

For faster service, call
1-800-626-4582 toll-free
1-319-338-7123 (Iowa Residents)

**KETEK** P.O. Box 203
Oakdale, IA 52319

YES! Rush me a Command Center to complete my system. I may enjoy it for up to 30 days and return it for a full refund.

☐ 64 .......................... $119.95
☐ 64C ........................ $129.95
☐ 128 ........................ $149.95

(Please include $3.50 for shipping and handling.)

Name

Address

City State Zip

Phone Number

**DEALER INQUIRIES INVITED**

**Reader Service No. 146**

# VIEW FROM THE BRIDGE

At no time of the year do we relish writing this column—our description of the contents of the current issue of *Ahoy!*—as much as in the fall, when our page count swells to its largest total. We can't wait to tell you about the special features in this 140-plus page issue—and, come to think of it: why *should* we?

• If you've ever felt buried under *Tons of Data,* Dale Rupert will lighten your load with his *Rupert Report* on sequential file storage. Included are *Datawriter* and *Datareader* routines for the C-64 and C-128 that can serve as models for your own file access programs. (Turn to page 20.)

• For the second month running, Cleveland M. Blakemore has dominated our games lineup with two high-quality contributions. *Guardian* recalls arcade classics like *Buck Rogers* and *Star Wars* as you race a shuttlecraft down a scrolling 3-D trench, blasting at an assortment of adversaries. (Turn to page 74.) Certain to win acclaim as our most offbeat program ever, *Teleporter* requires a keen eye and a steady disintegrator finger to survive in the employ of Captain Finch "Hardnose" Legree. (Turn to page 35.)

• Tony Brantner's tight graphics have elicited their share of oohs and ahs in the past *(Swoop, Meteor Run, Knockout)*—but he'll really bowl you over with this month's *Tenpins!*

• Comprised of five different scenarios that can cycle through to over fifty screens of nonstop action, *Discs of Daedalus* will throw even the most experienced space adventurer. (Turn to page 55.)

• Proving that we needn't leave earth to find suitable computer game villains, *Detonation* requires you, an explosives expert, to defuse the bombs Koloccan terrorists have placed throughout the sacred temple of Remkcalb. (Spell that backwards and you'll have the name of the programmer—or else, turn to page 56.)

• Of course, placing two programs in a single *Ahoy!* is commonplace for Buck Childress. This month's *Syntax Patrol* finds errors in your program lines immediately upon entry. (Turn to page 52.) And *128 RAM Check,* an adaptation of Buck's *Free RAM Check* for the 64 (May '86 *Ahoy!)*, promotes error-free operation by testing the BASIC RAM in banks 0 and 1. (Turn to page 39.)

• Depending on where your programming priorities lie, one of two programs in this issue may meet your needs. *Long Lines* doubles the C-64 line editor's capacity to 160 characters, making it possible to write faster-running programs with less memory overhead. (Turn to page 73.) *Deluxe List* follows behind space-stingy programmers and reroutes their work into an easily readable format. (Turn to page 36.)

• Mark Andrews breaks new ground in this month's *Commodore Roots* column on the C-128's "shadow registers"—undocumented areas of memory useful in sprite programming. You'll be a better machine language programmer when you know what *The Shadow Knows!* (Turn to page 27.)

• In the last of three *Cadet's Columns* devoted to alternative programming languages, Cheryl Peterson introduces beginners and experts alike to PROMAL. (Turn to page 95.)

• Seldom is a single game accorded feature coverage in our *Entertainment Software Section,* but we deemed QuantumLink's *Habitat* unusual enough to merit such treatment. Arnie Katz and his gang of game experts also provide reviews of *Frankie Goes to Hollywood, Super Cycle, Mind Mirror, Spitfire 40, Psi 5 Trading Co.*, and the entire Hi Tech Expressions line of creative software. (Turn to page 41.)

• In our *Reviews* section, Morton Kevelson goes to his usual elaborate lengths in profiling two products useful in accelerating computer-to-printer communications: R.J. Brachman's *Serial Box* and Xetec's *Printer Enhancer.* Additionally, Ted Salamone presents the results of his thorough testing of Timeworks' *Partner 128* cartridge. (Turn to page 58.)

• We hate to imagine the outcry that would result if this issue didn't also include *Commodares,* where intermediate and advanced programmers either meet the challenge—or their match; an extra-long installment of *Tips Ahoy!,* the best programming and hardware hints we can cull from our readership; *Scuttlebutt,* detailing upcoming releases for your holiday shopping convenience; and *S.O.S.*, where we provide answers to even the most unanswerable questions—even if we have to make them up.

This month's *Ahoy! Disk* features another of the bonuses it's becoming famous for—a demo of Firebird's *The Pawn* graphic adventure. For ordering information, see page 93; or try page 68 for an even better deal—the *Ahoy! Disk Magazine.*

And speaking of deals—if you procrastinated too long the last time we offered you a free modem (May), turn to page 88 before we pull the rug out again!

*—David Allikas*

## Ahoy! Port of Call on PlayNET

Hosted every week by *Ahoy!* SYSOP B.W. "Captain B" Behling, the *Ahoy! Port of Call* offers PlayNET subscribers an opportunity to teleconfer with *Ahoy!'s* writers and editors and other special guests. The show begins every Saturday at 11:00 p.m.

For information on subscribing to PlayNET, call 1-800-PLAYNET or see page 88.

**GRAPHICS INTERFACE • TELECOM BASIC AID • JOYSTICK • HANDWRITING ANALYSIS • BBS PROGRAM • NEW GAMES FROM ACTIVISION, MICROPROSE, ACCOLADE, ELECTRONIC ARTS • FOREIGN LANGUAGE SOFTWARE • PRINT SHOP, DELUXEPAINT ADDITIONS • FLIGHT SIMULATOR BOOK • MOZART MUSIC DISK**

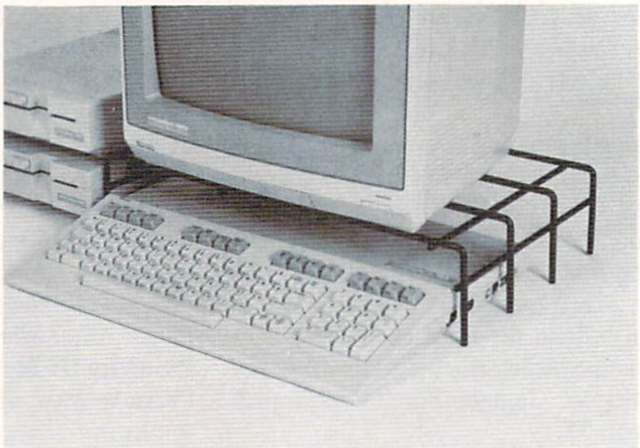
### BLACK IS BLACK

As you know by now if you check the financial pages daily to see if your 64, 128, or Amiga is an orphan, Commodore International reported a $1.2 million profit for the quarter ended June 30, 1986. That may not sound like much for a company Commodore's size, but it's reason for popping corks in West Chester, PA when compared to the $124 million loss for the same period in 1985. Commodore, in fact, was so excited about completing their first profitable quarter in over 18 months that they sent us a press release the very same day—despite the fact that they were thus obliged to publicize their $128 million loss for the fiscal *year* ended June 30, compared to a $114 million loss for the prior fiscal year.

But let's be as positive as Commodore. As life-threatening as their recent financial woes were, and despite the fact that its bank debt of over $138 million remains unresolved, the company managed to return to profitability despite overwhelming odds, partially due to such bold measures as laying off one third of its employees and closing down a number of its non-computer manufacturing operations. Commodore computer owners hoping for many more years of strong software and hardware support can take heart from the fact that the company has survived the darkest chapter in its history, and that more substantial gains are likely to be reported for the third and fourth (Christmas) quarters of 1986.

Commodore International, 215-431-9100 (see address list, page 14).

### EQUIPMENT STAND



*The Problem Solver Printer Stand helps you make more efficient use of your workspace, while placing your monitor at a more comfortable height for viewing the screen. READER SERVICE NO. 194*

Designed for placement above a C-64 or C-128, the Problem Solver Equipment Stand is especially useful for holding a monitor and freeing up desk space beneath, or supporting a printer with fanfold paper lying underneath. Crafted of vinyl-coated steel, the stand measures 18" wide by 4" high by 11" deep.

Cheatsheet Products Inc., 412-781-1551 (see address list, page 14).

### MOSTLY MOZART

*Volume III* in Free Spirit's *Music of the Masters* series is devoted almost entirely to the works of Mozart, totaling one hour of music and including the Overture from The Marriage of Figaro, Sonata Facile, Minuet from Don Giovanni, and several shorter works. Screen commentary on Mozart's life and music is provided as the music plays. Price of the C-64 disk is $9.95; all three volumes are available for $24.95.

Free Spirit Software, Inc., 312-352-7323 (see address list, page 14).

### IS OUR INTERFACE RED

In our mention of the *PPD* printer driver program in August's *Scuttlebutt* (page 12), we quoted a price of $10 for an unassembled cable kit. The correct price is $20. Drude Micro Services also informs us that the C-128 version is ready for shipping, and will be included on the same disk as the C-64 version.

Drude Micro Services, 319-277-5106 (see address list, page 14).

### HOLIDAY GRAPHICS

The *Holiday Edition* of *The Print Shop Graphics Library* provides graphics, fonts, and borders to be used with Broderbund's already legendary program to create cards, banners, signs, and letterhead. Included are images and symbols for 15 holidays. For the C-64; $24.95.

Broderbund Software, 415-479-1170 (see address list, page 14).

### NEW JOYSTICK

A study in ergonomic joystick design, the Epyx 500XJ joystick ($16.99) is curved on both sides to fit snugly in the user's left palm and provide a fingerhold (sorry, southpaws—you'll have to swivel the stick with your right hand). The stick clicks when moved in any of its eight directions. The internal switches are lo-

**FOR COMMODORE 128 AND C-64 OWNERS ONLY:**

# BLITZ!™

NOW SHOWING AT SKYLES ELECTRIC WORKS

## If your programs are slow, BLITZ!™ them

### It's Spectacular

Bob has discovered a spectacular compiler for the **Commodore 64** and the **Commodore 128** that he calls ***BLITZ!***

### It's Fast

***BLITZ!*** is faster than *PET SPEED*, faster than any other Commodore compiler that has come down the pike. Your ***BLITZ!***-compiled program will run from *five to 20 times* faster than it did before you blitzed it.

### It Translates

This disk program translates your slow BASIC programs into a much, much faster code. The ***BLITZ!*** compiler significantly improves the performance of your BASIC routines. It reads the entire program, reduces that program's size by deciding which operations need to only run once, interprets the operations, and then re-writes the program into its own special P-code.

C-64 or C-128

### It's a Treasure

Using this compiler, you can now create a string of BASIC programs such that one automatically loads the next. You can also pass information from one program to another. You will find the ***BLITZ!*** compiler a treasured tool in your programming kit.

### It's Popular

Reviewers and users have heaped the following praise on the ***BLITZ!***: "The ***BLITZ*** basic compiler is a dream come true for BASIC programmers." Compute!'s Gazette "worth its weight in gold." TPUG "Wonderful" "Fantastic" "I can't imagine programming without it" User comments. It is even more popular with professional programmers. Many commercial programs now say "***BLITZ!***" when they are listed. The ultimate accolade for ***BLITZ!***.

| | | WINTER SALE |
|---|---|---|
| ***BLITZ!* C-128, Disk** | | 69.95* |
| ***BLITZ!* C-64, Disk** | | 49.95* |

## QUICKSILVER 128™ now available for Commodore 128

Is the fastest IEEE-488 Interface available for the **Commodore 128.** How fast? As fast as the external IEEE-488 device will allow. For example, a program or file will load over four times faster from a Commodore 4040 or 8050 disk drive as compared to a 1541 disk drive. **QUICKSILVER 128** loads 5 times faster than a serial MSD drive. When used with printers speed is only limited by the printer.

**QUICKSILVER 128** is transparent. **QUICKSILVER 128** does not occupy any program memory. Almost all programs are completely compatible with **QUICKSILVER 128.** A word of caution, some IEEE disk drives have different formats, and 1541 formatted programs are not going to load. Some programs protect the disk by various operations in the 1541 disk memory. These programs will not load on non-1541 disk drives. However, for most uses **QUICKSILVER 128** is very quick and transparent.

C-64 or C-128

**QUICKSILVER 128** will interconnect your **Commodore 128** to Commodore SFD 1001, 2031, 2040, 3040, 4040, 8050, 8250, 9060, and 9090 Disk Drives. **QUICKSILVER 128** will connect your **Commodore 128** to Commodore 2022, 2023, 4022, and 4023 Printers.

**QUICKSILVER 128** is easy. Easy to plug into the cartridge port. Easy to plug additional cartridges into the built-in horizontal, cartridge port extender. Easy to locate your IEEE device within 6 feet of **QUICKSILVER 128** using the built-in 6 foot IEEE cable. Easy to select which device numbers you want **QUICKSILVER 128** to interface to the IEEE bus. Easy to use with almost all programs. Easy to buy, at an amazingly low price, from Skyles Electrics Works or your local dealer.

| | | WINTER SALE |
|---|---|---|
| **QUICKSILVER 128, C-128 Cartridge** | $119.95 | 99.95 |
| **IEEE Flash! 64, C-64 Cartridge** | | |

## So many cartridges, so little space...

Skyles Electric Works to the rescue, with our 2 + 1™ and 4 + 1™ expansion boards for the C-64. Briefly the **2 + 1** gives you 2 vertical and 1 horizontal fully switchable cartridge ports. The 4 + 1 continues the tradition with 4 vertical and 1 horizontal cartridge ports. See the inside front cover for more details.

| | | SUMMER SALE |
|---|---|---|
| **Skyles 2 + 1 Expansion Bd. C-64** | $49.95 | 39.95* |
| **Skyles 4 + 1 Expansion Bd. C-64** | $89.95 | 69.95* |

*There is an additional $4.50 U.S. and Canada, $15.00 Europe and Asia, shipping charge per order. California residents add sales tax.

Skyles Catalogue Page 3

**From Skyles Electric Works, the oldest and largest professionals in the business.**

***This is just a few of the 200+ bargains from the newest and biggest Skyles catalog, hot off the press.***

***We know you'll want this page, in its full splendor, and the other pages overflowing with over 200 bargains in peripherals, software, and books that will make your Commodore 128 or C-64 computer even nicer to live with.***

***So, if we missed sending you your very own copy within the last few weeks, call us at 1-800/227-9998, unless you live in California, in which case call 1-415/965-1735.***

Skyles Electric Works
231E South Whisman Road
Mountain View, CA 94041
(415) 965-1735

Reader Service No. 171

LOTTERY 64
LOTTERY +4

NOT WINNING WITH YOUR SYSTEM?
. . . TRY OURS!

WE'VE ALREADY WON THOUSANDS WITH IT AND WE'RE STILL WINNING!

LOTTERY has been designed to use the computing power of the COMMODORE computer to help you play the various lottery games: PICK 3, PICK 4, LOTTO, SUPER LOTTO, 6/49, LUCKY LOTTERY, etc. It can be used with any lottery game in which you pick the numbers.

AVAILABLE ON DISKETTE ONLY.
SPECIFY 64/128 or PLUS/4

To order, send $24.95 for each plus $3.00 postage and handling per order to:
(Illinois residents add 6% sales tax)

MasterCard VISA

C.O.D. orders call: (312) 566-4647

SMS

Superior Micro Systems, Inc.
P.O. Box 713 • Wheeling, IL 60090
*Dealer inquiries welcome!*

Reader Service No. 192

**Keep Your Collection Looking Shipshape with Ahoy! Binders**




Don't be caught at sea the next time you need valuable programming information from a back issue of *Ahoy!* Our official binders turn a year's worth of *Ahoy!* into a textbook on Commodore computing! These quality-constructed binders use metal rods to hold each magazine individually, allowing easy reference to any issue without removal. Sporting a navy blue casing with a gold *Ahoy!* logo imprinted on the spine, these binders will be the pride of your computer bookshelf.

To order, send $12.45 (US funds) for each binder desired to:
*Ahoy!* Binders
45 West 34th Street – Suite 407
New York, NY 10001
(Outside Continental US add $2.50 per binder. Allow 4 to 6 weeks for delivery.)

cated near the top of the base unit, closer to the stick itself than in many other brands, supposedly providing quicker response. The fire button is activated by the trigger finger rather than the thumb – also, we're told, promoting higher scores. Epyx is so sure it will that they sent us samples for all our game reviewers. We'll report on their findings in an upcoming *Entertainment Software Section.*

Epyx, Inc., 408-745-0700 (see address list, page 14).

## GRAPHICS INTERFACE

The Device One parallel printer interface for the C-64 ($119.95) includes among its many features the ability to download fonts, pictures, and disk directories directly from disk, print hi-res pictures and text together in two sizes and half-tone mode, and combine up to four different font sizes and thirteen different font styles (four of which are in ROM) in a single sentence. A banner mode provides for letters up to 8" high, and a letterhead mode allows a message or picture to be printed in the same spot on every page. Near letter quality characters can be integrated with text, pictures, fonts, and banners.

(Deep breath.) Screen dump mode for lo- and hi-res screens; hex and decimal dump modes; Pet ASCII conversion mode; device number selection; built-in 16K buffer; definition of all four margins; transparent and semi-transparent modes. The included utility disk can be used for creating fonts, drawing pictures, and converting pictures from most graphic packages to work with built-in picture dump.

Progressive Peripherals & Software, 303-825-4144 (see address list, page 14).

## GAME RELEASES

*Tass Times in Tonetown* requires players to find Gramps, missing in a village in another dimension where "all rules change." The player must also become "tass" to avoid being marked as a tourist and booted out of Tonetown. Onscreen icons allow the game to be played with a minimum of typing. $34.95 for the 64; $39.95 for the Amiga.

Activision has also released the first two in a series of Designer's Libraries for use with *Garry Kitchen's GameMaker: The Computer Game Design Kit,* each providing predesigned game elements to facilitate game creation. The *Sports* library includes a race track, football field, skier, and hockey player, and such sound effects as crowd noises, buzzers, a referee's whistle, and the crack of a bat. The *Science Fiction* disk provides space ships, energy fields, planet surfaces, and monsters. Selections can be used as they are or customized using *GameMaker.* Each C-64 disk is $19.95.

And finally, Activision has formed another new division: Electric Dreams, which will distribute foreign entertainment software in America. Three initial releases have been announced, all for the C-64, each $29.95:

*The Rocky Horror Show* incorporates the main elements and characters from the movie, requiring you as Brad to find the abducted Janet and assemble the De-Medusa machine.

*Spindizzy* compels you to guide a gyroscopic device across 386 multilevel screens that must be assembled into a single world.

Based on the Tomy toys, *Zoids* requires you, an earthling, to intervene in the war between the Red and Blue Zoids by building a robot to defeat the Red Zoid Imperial Leader.

Activision, 415-960-0410 (see address list, page 14).

In order to foil the intergalactic smuggling ring called the *Breakers* ($39.95) and free the enslaved Lau people, text adventurers must outwit the criminals and dodge mutant space cops while combining the sacred elements that can restore order to the planet. The game's parser understands 1500 words, making dialogue puzzles with several characters possible. A reference card and book are included.

Broderbund Software, 415-479-1700 (see address list, page 14).

Software Toolworks' *Chessmaster 2000* offers 20 levels of play from Newcomer to Grandmaster, an open-




*Mean 18's course architect makes it possible to design or modify an entire course, including trees, bushes, skyline, background, terrain, course name, and any or all of the 18 holes and par values.* READER SERVICE NO. 195

ing library of 71,000 moves, and a "teach" mode allowing the program to demonstrate all possible moves. Also featured are onscreen clocks, "coffeehouse" mode (in which the computer plays a slightly addled game to encourage the beginner), and analysis of games in progress or games already played. $39.95 for the 64; $44.95 for the Amiga.

Planned releases from Software Toolworks include *The New Technology Coloring Book,* utilizing the Amiga's graphics capabilities to take the user on a "journey through the mysteries of science and the universe;" and *Life and Death,* simulating the experience of practicing medicine in the emergency room of a big city hospital.

The Software Toolworks, 213-278-8450 (see address list, page 14).

Effective immediately, Datasoft games will be packaged with Frequent Buyer Coupons that can be collected and cashed in for free gifts. Seven coupons will entitle the customer to choose a gift worth up to $20 from a 100-item catalog; ten coupons, a gift worth up to $25; fourteen coupons, up to $50.

Datasoft, IntelliCreations, Inc., 818-886-5922 (see address list, page 14).

*Space, the Ultimate Frontier* ($8.99) places the user on the bridge of a starship with the task of defending the sector against the invading Klyron Empire.

Ufland Software, Inc., 519-538-1758 (see address list, page 14).

The Amiga version of Accolade's *Mean 18* golf simulation ($44.95) features enhanced graphics, resolution, color, and sound, four courses including St. Andrews, Augusta National, and Pebble Beach, a golf course architect, and numerous strategy and play options. Also included are a driving range and putting green, plus such landscape features as sand traps, bunkers, water, and roughs.

Accolade, 408-446-5757 (see address list, page 14).

*A Christmas Adventure* has been available for the 64 for the past three holiday seasons, but this year BitCards will send a free sampler/demo disk containing over half of the actual program to anyone who sends $1 in cash or stamps to cover shipping costs. Price of the full program, to which it is possible to add personalized holiday greetings, is $24.95 plus $3 shipping.

BitCards Inc., 800-821-5226/ext. 432 or 514-274-1103 (see address list, page 14).

Newly adapted for the Amiga from Electronic Arts:

EA's first adaptation of an arcade game, *Marble Madness* ($49.95) duplicates the phenomenal arcade original faithfully in terms of 3-D graphics, sound, and gameplay. The goal of one or two players is to race a marble down treacherous paths in an attempt to beat the clock to the goal line. Adversaries along the way include the Hoovers, who seek to inhale you, Marble Munchers, and the Steelie, who attempts to knock you marble into a fatal tumble. Each of the six different raceways has its own stereo soundtrack.

## COMAL Starters Kit
**$29.95** plus $4 shipping

**5 Disks* including:**
- 1541 Fast Loader
- Disk Backup
- File Copier
- Full C64 COMAL 0.14
- over 100 more programs

**2 Books, nearly 150 pages:**
- COMAL From A To Z
- Graphics Primer

**5 newsletters, over 400 pages:**
- COMAL Today (#5,6,7,8,9)

## COMAL 2.0 POWER
**$69.95** Comal Today subscriber price --- $74.95 regular price.

64K COMAL 2.0 cartridge with empty socket (no manual) (manual add $15 and $3 shipping)

## SUPER CHIP
**$24.95** Comal Today subscriber price --- $29.95 regular price. 16K chip plugs into empty socket of COMAL 2.0 cartridge. Adds:

- C128 Support
- C64 Auto Boot System
- 1541 Fast Loader
- **Over 100** added commands

## COMAL TODAY
**$14.95** (Canada add $6)

- 6 issue subscription
- **Over 500 pages**
- Qualifies you for subscriber discounts (like $5 off a Comal 2.0 cartridge)

## FREE INFO

Send a 39 cent stamped self addressed envelope. You get our 24 page **info** booklet.

**COMAL Users Group USA**
6041 Monona Dr, Room 111
Madison, WI 53716
phone: (608) 222-4432

*2 disks may be 1 double sided disk

Featuring enhanced graphics and sound, the *Skyfox* combat flight simulation, *Adventure Construction Set*, and the action-magic adventure *Archon II: ADEPT* will retail for $39.95 each.

Electronic Arts, 415-571-7171 (see address list, page 14).

*Casino Blackjack* ($19.95) provides full player and dealer statistics and a wide range of casino options including split pair, insurance, and double down.

Dragon Magic Software (see address list, page 14).

Polarware/Penguin Software's illustrated adventures, *Transylvania* and its sequel *Crimson Crown*, have been enhanced for the Amiga. The games, each $29.95, chronicle the struggle between the royal family of Wallachia and the evil Vampyr.

Polarware/Penguin Software, 312-232-1984 (see address list, page 14).

Six releases for the C-64 and/or Amiga from Artworx:

*Beach Blanket Volleyball* ($14.95), playable against another human or against the C-64 on nine levels, provides the usual opportunities to return impossible shots, spike the ball close to the net, etc. All that's missing is the sand in your hot dog.

*Police Cadet* for the C-64 ($14.95) requires the recruit to keep the peace on a beat, a stakeout, in a deserted park, and in a supermarket, capturing armed suspects or shooting them when necessary. But don't shoot an innocent bystander, or your career will be over.

*Hole In One Golf,* which includes club and swing selection and a course design option, has been adapted for the Amiga ($29.95), while *Hole In One Golf +6* ($19.95) for the 64 adds a sextet of courses to Artworx's original program.

*Equestrian Showjumper* for the 64 ($14.95) lets one to six players compete with horses from nations around the world, jumping fences of varying height and difficulty on twelve provided courses.

*Strip Poker*, adapted for the Amiga ($39.95) after release in several other formats, makes use of a variety of computer opponents, each with his or her own style of play, personality, and comments—and, of course, detailed graphics. Two female opponents are included; data disks containing additional opponents of both sexes will be made available.

*Bridge 4.0*, also adapted for the Amiga ($29.95), utilizes speech synthesis and lets the player make all bird and card selections via the mouse.

Artworx Software, 716-425-2833




*Three aerial war games on one disk.*
*READER SERVICE NO. 196*


LEROY'S CHEATSHEET®
Keyboard Overlays


$7.95 each

PLASTIC LAMINATED


$3.95 each

For your **COMMODORE 128**

For your **COMMODORE 64**

**Put Your Computer's Commands Where They Belong - And Your Manuals On The Shelf.**

Have you ever sat at your computer with the manual in your lap trying to find an elusive command? How much time have you lost searching through manuals to refresh your memory on how to do what you wanted? Now you have a way to end that frustration - **Leroy's Cheatsheets®**

**Leroy's Cheatsheets** help you get into your program right away. We put the commands right at your fingertips, actual keystrokes are in **bold** type, variables are shown in *italics*. Designed by software experts, our durable plastic laminated overlays are comprehensive reference aids which document a product or system completely. Now use your software more easily and more effectively. With Leroy's Cheatsheets you'll never have to hunt for a program command again!!! See below for ordering information.

SOFTWARE




DISCOUNT SOFTWARE
& FREE CHEATSHEET

We carry a complete line of software at competitive prices. **PLUS** - on any software package of $25.00 or more you get a *FREE* **Leroy's Cheatsheet®** of your choice! CALL or WRITE TODAY for prices.

The Problem Solver
EQUIPMENT STAND *By Leroy*

ONLY $ 19.95





Made of **sturdy vinyl coated steel**-strong enough for any computer equipment. This equipment stand will help you **organize your system**. With this unique construction, cables are never in the wrong place, switches are more accessable and your equipment **stays cooler**. The problem Solver Equipment stand was **specially designed** for Commodore computers 128 & 64. Keeps your monitor at eye level (Great for **printers** too). See below for ordering information.

Order Now and Save ... Money, Time and Frustration

COMMODORE 128 *$7.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the commodore 128 for only 7.95 each plus shipping.

DIE - CUT

- ☐ Basic 7.0
- ☐ Blanks (3-NOT laminated)
- ☐ Data Manager 128
- ☐ Disk 1571
- ☐ Easy Script
- ☐ **Elite**
- ☐ Fleet system 2 & 3
- ☐ **Flight Simulator 2**
- ☐ For The Beginner
- ☐ Multiplan 128
- ☐ **Paperback Writer**
- ☐ Paperclip 128
- ☐ Superbase 128
- ☐ **Superscript 128**
- ☐ Wordpro 128
- ☐ **Word Writer 128**

*FREE* - **Keyboard extender** (each order)

COMMODORE 64 *$3.95 ea*

Please send me the following **LEROY'S CHEATSHEETS** for the COMMODORE 64 for only $3.95 each plus shipping.

CUT-OUT-YOURSELF ON DOTTED LINES

- ☐ Basic 2.0
- ☐ Blanks (3-NOT laminated)
- ☐ **Data Manager**
- ☐ Disk 1541
- ☐ Doodle
- ☐ Easyscript
- ☐ **Elite**
- ☐ Fleetsystem 2
- ☐ Flight Simulator 2
- ☐ For The Beginner
- ☐ **GEOS**
- ☐ Multiplan
- ☐ **Newsroom**
- ☐ **Paperback Writer**
- ☐ Paperclip
- ☐ Sky Travel
- ☐ Speedscript
- ☐ Superbase 64
- ☐ **Superscript 64**
- ☐ **Word Writer**

**Also fits the COMMODORE 64C**

☐ Please send me **Equipment stands** for only ***$19.95*** each plus shipping.

**HOW TO ORDER:**
* Send personal check, money order or Master Card / VISA card information.

**SHIPPING:**
* Leroy's Cheatsheets - ***$1.00*** per order (Foreign Orders ***$3.00***)
* Equipment Stand ***$3.00*** each Cont U.S. ***$5.00*** -each Canada, Alaska, Hawaii

**No foreign orders please**

**TAXES:**
* Add 6% sales (include shipping) for Pennsylvania residents only)

ahy 10 Phone orders welcome HOURS: **7:30** AM - **5** PM Eastern Time Monday thru Friday

Name ____________

Address ____________

City ____________ State ___ Zip ______

No surcharge for Visa or Master card

U. S. FUNDS ONLY NO C.O.D

☐ VISA ☐ MASTER CARD ☐ PAYMENT ENCLOSED (check or money order)

CARD # ____________ Exp ___/___

*CHEATSHEET PRODUCTS, INC.* **P.O. Box 111368 Pittsburgh, PA. 15238 (412) 781-1551**

COMMODORE 64 is a registered trademark of Commodore Electronics, Ltd. COMMODORE 128 is a trademark of Commodore Electronics, Ltd.

(see address list, page 14).

MicroProse's *Top Gunner Collection* ($24.95) combines three previous releases on one double-sided disk for the C-64: *HellCat Ace* (re-creation of 14 significant US-Japan battles), *MiG Alley Ace* (dogfighting between the F-86 Sabre Jet and the Red Chinese MiG 15), and *Air Rescue* (piloting a copter through an underground labyrinth).

MicroProse won't reveal the name or any other details about the flight simulator they plan to release in the first quarter of '87, except that it will have "the best of everything all the other simulators have."

MicroProse, 301-667-1151 (see address list, page 14).

### BOOKS

A revised and expanded edition of Jim Butterfield's previous volume covering only the 64, *Machine Language for the Commodore 64, 128 and Other Commodore Computers* ($14.95) offers step by step instructions, examples, and exercises for programmers at all levels, including beginners with knowledge of fundamentals. The book covers machine architecture (where a program can be placed in memory, how to print to the screen, how to input from keyboard), tools (using a monitor to read and change memory, using a simple assembler, and debugging), and machine language itself.

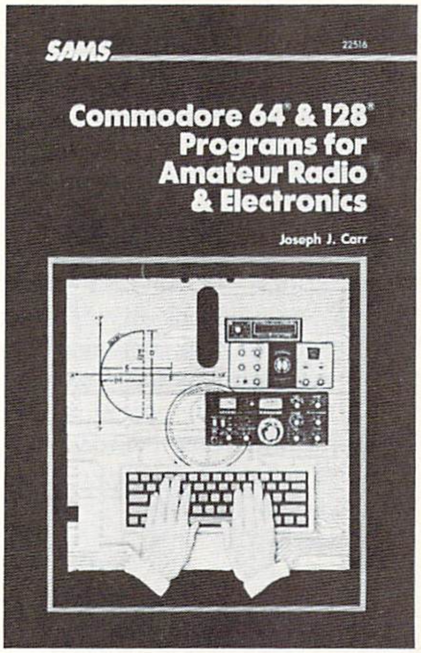
Prentice Hall Press, 212-333-2916 (see address list, page 14).

A booklength tutorial devoted to SubLOGIC's *Flight Simulator II, The Flight Simulator Book* ($19.95) uses dozens of actual government aviation charts to teach the student to do everything an airline captain does, from aviation basics through maneuvers, flight planning, cross-country procedures, radio navigation, instrument landings, and more.

En Route Books, 602-846-6737 (see address list, page 14).

These from Howard W. Sams:

*Commodore 64 & 128 Programs for Amateur Radio & Electronics* ($14.95), a task-oriented guide for the electronics hobbyist, programmer, engineer, and technician, includes 42 programs (available on disk) to save time and simplify tasks.




*Task-oriented guide for the hobbyist.*
*READER SERVICE NO. 197*

*John D. Lenk's Troubleshooting & Repair of Microprocessor-Based Equipment* ($21.95) details numerous procedures and tricks for diagnosing, isolating, and locating faults in microprocessor circuits.

Howard W. Sams & Co., 1-800-428-SAMS (see address list, page 14).

### EDUCATIONAL RELEASES

Gessler has released Spanish and French Hangman games for the 64: *La Corrida de Toros,* set in a bull ring, and *La Guilotine,* depicting events at the Bastille. Each $29.95 program includes hundreds of words in numerous categories, a vocabulary review, and a matching exercise.

Also from Gessler comes CLEF, a 30-disk series of Computer-assisted Learning Exercises for French for use in beginning and intermediate French classes. Each C-64 disk focuses on a particular point of grammar or group of vocabulary words, including a series of individually graded exercises and analysis of errors. Price is $19.95 for one disk, $85 for five, or $499 for all thirty.

Gessler Educational Software, 212-673-3113 (see address list, page 14).

## COMAL 2.0 POWER C128 SUPPORT WITH SUPER CHIP ONLY $94.90*

- Full 80K Cartridge
- Super Chip installed
- C128 Support
- C64 Auto Boot System
- 1541 Fast Loader
- Over 100 added commands

## COMAL Starters Kit
**$29.95** plus $4 shipping

**5 Disks** including:**
- 1541 Fast Loader
- Disk Backup
- File Copier
- Full C64 COMAL 0.14
- over 100 more programs

**2 Books, nearly 150 pages:**
- COMAL From A To Z
- Graphics Primer

**5 newsletters, over 400 pages:**
- COMAL Today (#5,6,7,8,9)

## COMAL TODAY
**$14.95** (Canada add $6)

- 6 issue subscription
- **Over 500 pages**
- Qualifies you for subscriber discounts (like $5 off a Comal 2.0 cartridge)

## FREE INFO

Send a 39 cent stamped self addressed envelope. You get our 24 page info booklet. Or order now. VISA and MasterCard accepted. US dollars only.

COMAL Users Group USA
6041 Monona Dr, Room 111
Madison, WI 53716
phone: (608) 222-4432

**2 disks may be 1 double sided disk
* Comal Today subscriber price. $104.90 regular price. No manual. Add $15 plus $3 shipping for manual

EDUCATIONAL · BUSINESS · ENTERTAINMENT · EXCLUSIVE OFFERS · EXCLUSIVE PRICES · BUSINESS · DISCOUNT PRICES · LATEST RELEASES · DISCOUNT · EDUCATIONAL · BUSINESS · BONUS COUPONS · LATEST · CATALOGUES & NEWSLETTERS · DISCOUNT · TOLL FREE ORDER LINE · BONUS COUPONS

DISK-OF-THE-MONTH CLUB GUARANTEES

LOWEST PRICES

YOUR SUPERMARKET TO GREAT SOFTWARE VALUES



ORDER LINES
800-345-CLUB
201-794-3220

SEND FOR DETAILS

NO OBLIGATION

DISK-OF-THE-MONTH CLUB
P.O. BOX 116, FAIR LAWN, N.J. 07410-0116

NAME

STREET ADDRESS

CITY STATE

ZIP

Div. of UNLIMITED SOFTWARE INC

Reader Service No. 203



*Free Spirit Software, Inc.*

**Music of the Masters** - Classical music for the C64* or C128* in 64 mode. Approx. 1 hour of music per disk with comments on the composers.
**Volume I** - Mozart's Rondo Alla Turca, Beethoven's Sonata Pathetique and 20 other works by Bach, Handel & many others.
**Volume II** - Beethoven's Minuet in G, Bach's Invention No. 4, and 40 other works by Brahms, Schubert, Chopin & others.
**Volume III** - Mostly Mozart. Overture from Figaro, Sonata Facile, Minuet from Don Giovanni and many other Mozart compositions. $9.95 per volume. All 3 volumes - $24.95

**The Great War** - WWI strategy game for the C128* in 128 mode. Includes one or two player options. Armies of 17 countries. Weather, terrain, lines of supply, etc. affect the outcome. C128* disk only - $29.95

**BASICally SIMPLE 128** - How to use all C128* Basic 7.0 commands, functions and operators in Basic programs. C128* disk only - $19.95
**BASICally SIMPLE 64** - How to use all C64* Basic 2.0 commands, functions and operators in Basic programs. Disk - $14.95

**Datafiler 128** - Database program for the C128* in 128 mode. Disk - $24.95

FREE SHIPPING & HANDLING. Illinois residents add 7% sales tax. Send check or money order to:

Free Spirit Software, Inc.
538 S. Edgewood
LaGrange, IL 60525

*Trademarks of Commodore Electronics, Ltd.

Reader Service No. 200


Educational Activities will send its catalog of over 100 programs (not all of them available for Commodore) free to educators who request it.

Educational Activities, 516-223-4666 (see address list below).

### BASIC EXTENSION

*The Boss* ($35) provides C-64 users with over 40 new BASIC commands and functions, mostly useful for writing data communications-type programs. Included are commands for performing I/O operations with the modem, turning the modem on and off, getting user inputs of specified lengths from the other end, checking for carrier, and more. The program handles all ASCII translation and utilizes system timers.

SoftTools, 514-739-3046 (see address list below).

For more information on products accompanied by a Reader Service Number, fill out and return the card bound between pages 66 and 67.

### MIDI SOUNDS

MIDImouse has added Volumes 3 and 4 to its CZ Sound Collection series of acoustic and electronic sounds for the MIDI-equipped C-64. Each disk-based volume is $14.95, or $21.95 for two, $28.95 for three, or $35.95 for four. The collection is also available on two 64-voice RAM cartridges priced at $69.95 each, or both for $124.95. Demo cassette is $4.

Also new is a Digital Sound Cassette of 125 sounds for $17.95. (A disk

*Continued on page 146*

### Companies Mentioned in *Scuttlebutt*

**AC3L Software**
P.O. Box 7
New Derry, PA 15671

**Accolade**
20833 Stevens Creek Blvd.
Cupertino, CA 95014
Phone: 408-446-5757

**Activision, Inc.**
2350 Bayshore Frontage Rd.
Mountain View, CA 94043
Phone: 415-960-0410

**Artworx Software Company**
150 North Main Street
Fairport, NY 14450
Phone: 716-425-2833

**BitCards Inc.**
P.O. Box 1289
Champlain, NY 12919
Phone: 800-821-5226/ext. 432 or 514-274-1103

**Broderbund Software Inc.**
17 Paul Drive
San Rafael, CA 94903-2101
Phone: 415-479-1170

**CTL Software**
115 Bixby Drive
Milpitas, CA 95035
Phone: 408-263-1623

**Cheatsheet Products Inc.**
P.O. Box 111368
Pittsburgh, PA 15238
Phone: 412-781-1551

**Commodore International**
1200 Wilson Drive
West Chester, PA 19380
Phone: 215-431-9100

**Datasoft**
IntelliCreations Inc.
19808 Nordhoff Place
Chatsworth, CA 91311
Phone: 818-886-5922

**Dragon Magic Software**
P.O. Box 490
Dublin, OH 43017

**Drude Micro Services**
P.O. Box 533
Cedar Falls, IA 50613
Phone: 319-277-5106

**Educational Activities, Inc.**
1937 Grand Avenue
Baldwin, NY 11510
Phone: 516-223-4666

**Electronic Arts**
1820 Gateway Drive
San Mateo, CA 94404
Phone: 415-571-7171

**En Route Books**
6408 West College Drive
Phoenix, AZ 85033
Phone: 602-846-6737

**Epyx, Inc.**
1043 Kiel Court
Sunnyvale, CA 94089
Phone: 408-745-0700

**Free Spirit Software, Inc.**
538 S. Edgewood
LaGrange, IL 60525
Phone: 312-352-7323

**Gessler Software**
900 Broadway
New York, NY 10003
Phone: 212-673-3113

**Howard W. Sams & Co.**
4300 W. 62nd Street
Indianapolis, IN 46268
Phone: 1-800-428-SAMS

**MicroProse**
120 Lakefront Drive
Hunt Valley, MD 21030
Phone: 301-667-1151

**MIDImouse Music**
Box 272-MS
Rhododendron, OR 97049
Phone: 503-622-5451

**Polarware/Penguin Software**
521 Hamilton
P.O. Box 311
Geneva, IL 60134
Phone: 312-232-1984

**Prentice Hall Press**
Gulf+Western Building
One Gulf+Western Plaza
New York, NY 10023
Phone: 212-333-2916

**Progressive Peripherals & Software, Inc.**
464 Kalamath Street
Denver, CO 80204
Phone: 303-825-4144

**QuantumLink**
8620 Westwood Center Drive
Vienna, VA 22180
Phone: 800-392-8200 or 703-448-8700

**SoftTools**
Snowdon P.O. Box 1205
Montreal, Quebec
Canada H3X 3Y3
Phone: 514-739-3046

**The Software Toolworks**
9713 Santa Monica Blvd.
Beverly Hills, CA 90210
Phone: 213-278-8450

**Ufland Software Inc.**
Box 1324
Meaford, ONT
Canada N0H 1Y0
Phone: 519-538-1758

# NUMBER ONE ARCADE HITS...




Put on your black belt and challenge your friends or the computer through nine picturesque settings in this leading Martial Arts Game to become the **KARATE CHAMP**. For the Commodore 64™/128 and the 48K Apple II® Series.

As the crack shot **COMMANDO**,* battle overwhelming odds to defeat advancing rebel forces. Armed with only a machine gun and hand grenades, you must break through the enemy lines to reach the fortress. For the Commodore 64™/128.

Prepare for the fight of your life . . . you are the **KUNG-FU MASTER**.** Battle the evil forces through the five dangerous floors in the wizard's castle to rescue the captive fair maiden. For the Commodore 64™/128 and the 48K Apple II® Series.

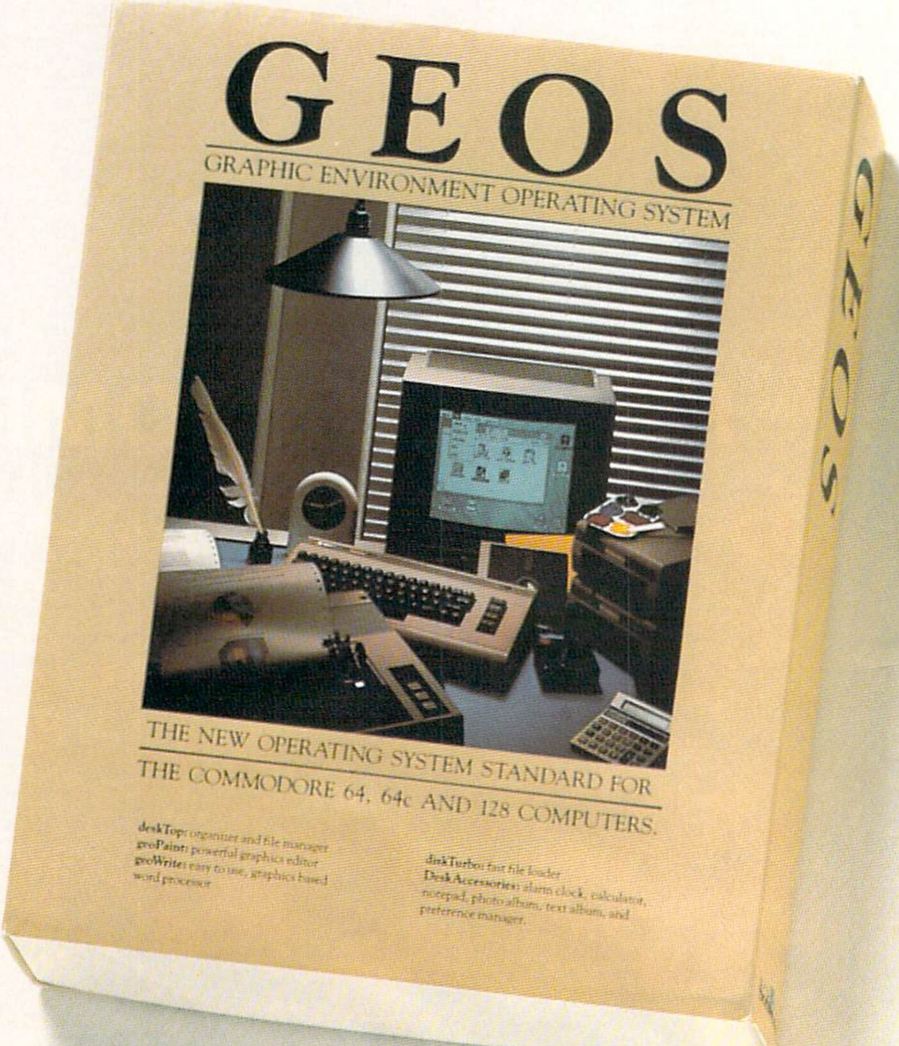
Apple and Commodore 64 are trademarks of Apple Computer, Inc. and Commodore Electronics, Ltd. respectively.
* © Data East USA, Inc. Mfd. under license from Capcom USA.
** © Irem Corp. Mfd. under license by Data East USA, Inc.
Reader Service No. 179

DATA EAST

**DATA EAST USA, INC.**
470 Needles Drive, San Jose, California 95112
(408) 286-7074

© 1986 Data East USA, Inc. All rights reserved.

# SCIENTISTS A
# DISCOVER NE




When we started our company on the west coast, people thought we were a little spaced out. So you can imagine their reactions when we announced we'd discovered a new universe.

People laughed. People scoffed. And they really freaked out when we told them where we'd found it:

Inside a Commodore 64.

It's called GEOS. And it turns any Commodore into a powerful PC that holds its own against any computer, no matter what kind of fruit it was named after.

**GEOS: The superior intelligence.** Of course, we always knew Commodores possessed superior brains. It just took GEOS to discover them.

You see, GEOS opens your Commodore to a huge universe that can hold an infinite number of applications. Which means that GEOS can do just about anything the expensive PC's can do, including one thing they can't:

Add even more GEOS applications that are being developed even as you read this.

**Increase your speed to warp factor 7.** The first thing you notice with GEOS is how its diskTurbo speeds up your Commodore's disk loading and storing time.

Not twice or three times as fast. But five to seven times faster than normal. Which lets you streak through files and documents at what seems like warp speed.

And that saves you endless time.

**Every universe comes complete with a desk.** The way to keep order in our universe is with the GEOS Desktop. It's just like your desk at home, only without the coffee stains.

The Desktop keeps your art and documents filed, and comes

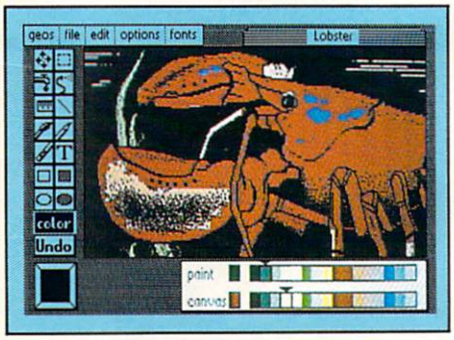
# AT BERKELEY
# EW UNIVERSE.

with all the accessories you need to keep you organized:

An alarm clock keeps you punctual. A notepad keeps your memos. And a calculator keeps your accountant honest.

**How to communicate with a new universe.** With geoWrite, you can rearrange your written words. Move blocks of copy. Cut and paste. And even display your text in fonts of different styles and sizes, right on the screen.

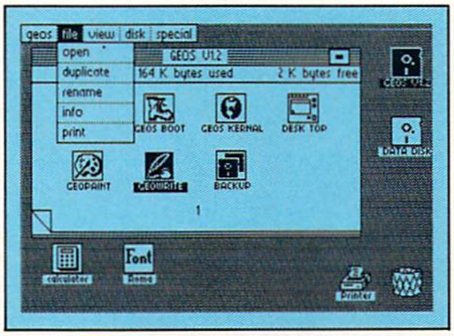
With geoPaint, you become a Michelangelo with a mouse.




Sketching and painting with all kinds of colors, textures and patterns.

You can invert, mirror and rotate images. Insert them into your geoWrite documents. And save them in your GEOS Photo Album for use later.

**Finding your way through the universe.** The most difficult




thing about a new universe is finding your way around. But with GEOS, you only need to remember two things:

Point and click.

When GEOS offers you options, you just point to your answers and click your mouse or joystick.

You want to draw? Point and click.

You want to write? Point and click.

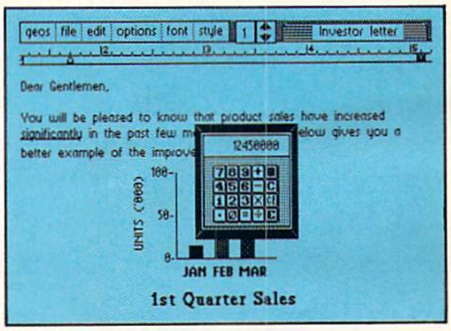
You want to fill in that obtuse rhomboid with an air-brushed geometric pattern in a lighter shade of pink? Point and click.

Easy, huh? And in case you ever do make a mistake, GEOS backs you up with an "Undo" feature that undoes the very last command you entered.

**Running out of space.** With GEOS, that's hardly likely. Because there's endless space in the universe for new applications.

Unfortunately, there's only so much space in this ad.

So zip down to your nearest software dealer. Tell him you want to explore the new universe in your Commodore.




And if he looks at you like you're some kind of alien, well, just tell him Berkeley Softworks sent you.

The name is universally known.

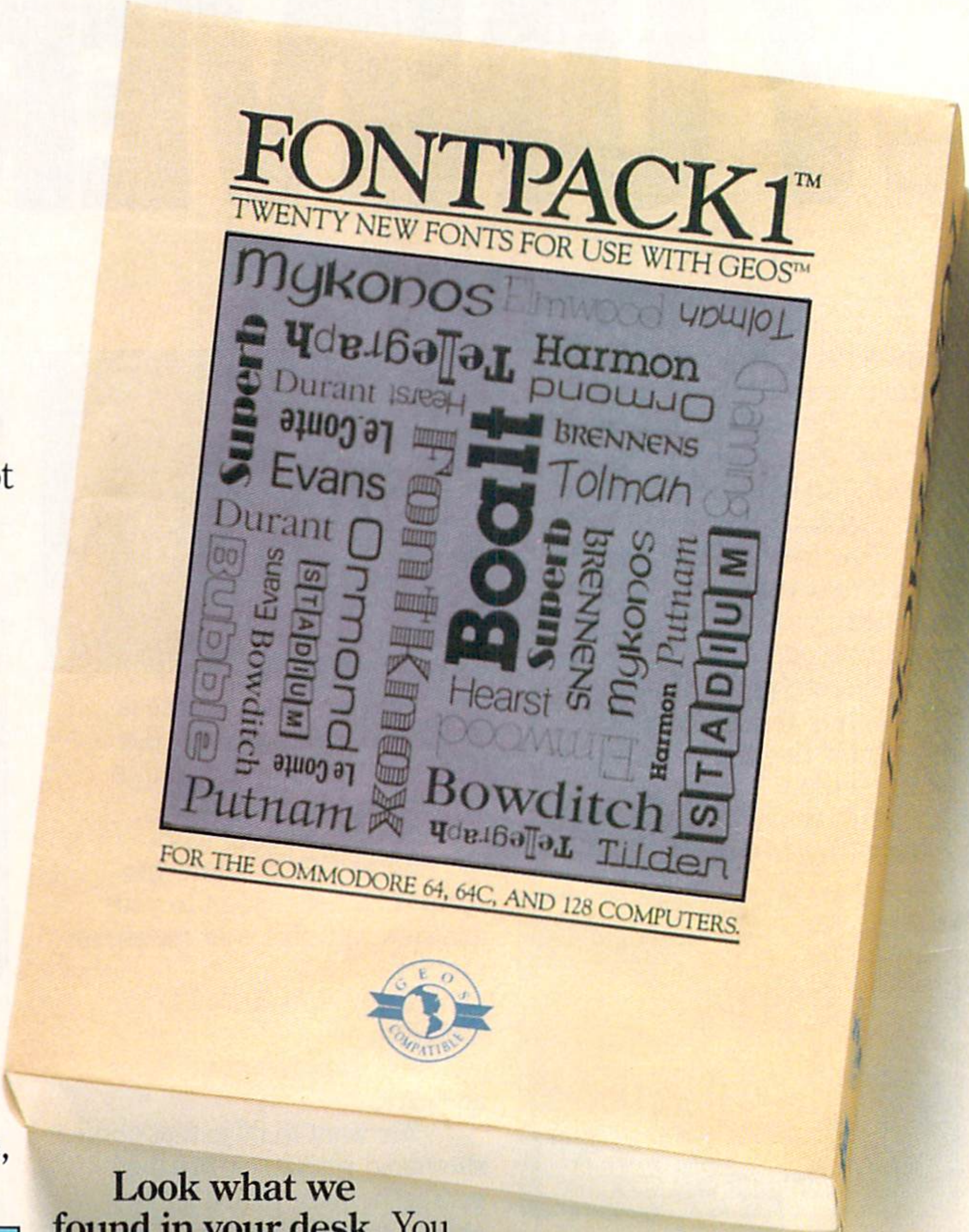
*To order, call 1-800-443-0100 ext. 234*
**GEOS is just $59.95**
(California residents add 6.5% sales tax.)
$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.
Commodore 64 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo and Berkeley Softworks are tradenames of Berkeley Softworks.

Reader Service No. 147

Berkeley Softworks

**The brightest minds are working at Berkeley.**

# THE UNIVERSE




Well, we told you it wouldn't be long until the first GEOS applications were ready. And these are just the first. The number of satellites in the GEOS universe is infinite.

**Judge Font Pack on looks alone.** Let's face it. People judge your work not only by what it says, but how it looks.

That's why we developed Font Pack. A collection of 20 different type styles that not only say what you mean, but really look like they mean it.

Charming is charming. **Boalt** is all business. FontKnox is financial. And **Telegraph** is ... hmmm, well, you get the point.

When you combine these 20 fonts with the five you get with geoWrite, your work not only reads

| | |
|---|---|
| Boalt | STADIUM |
| Bubble | Telegraph |
| Durant | Mykonos |
| Harmon | Superb |
| Ormond | Tilden |
| LeConte | Bowditch |
| Putnam | |

better, it practically speaks for itself.

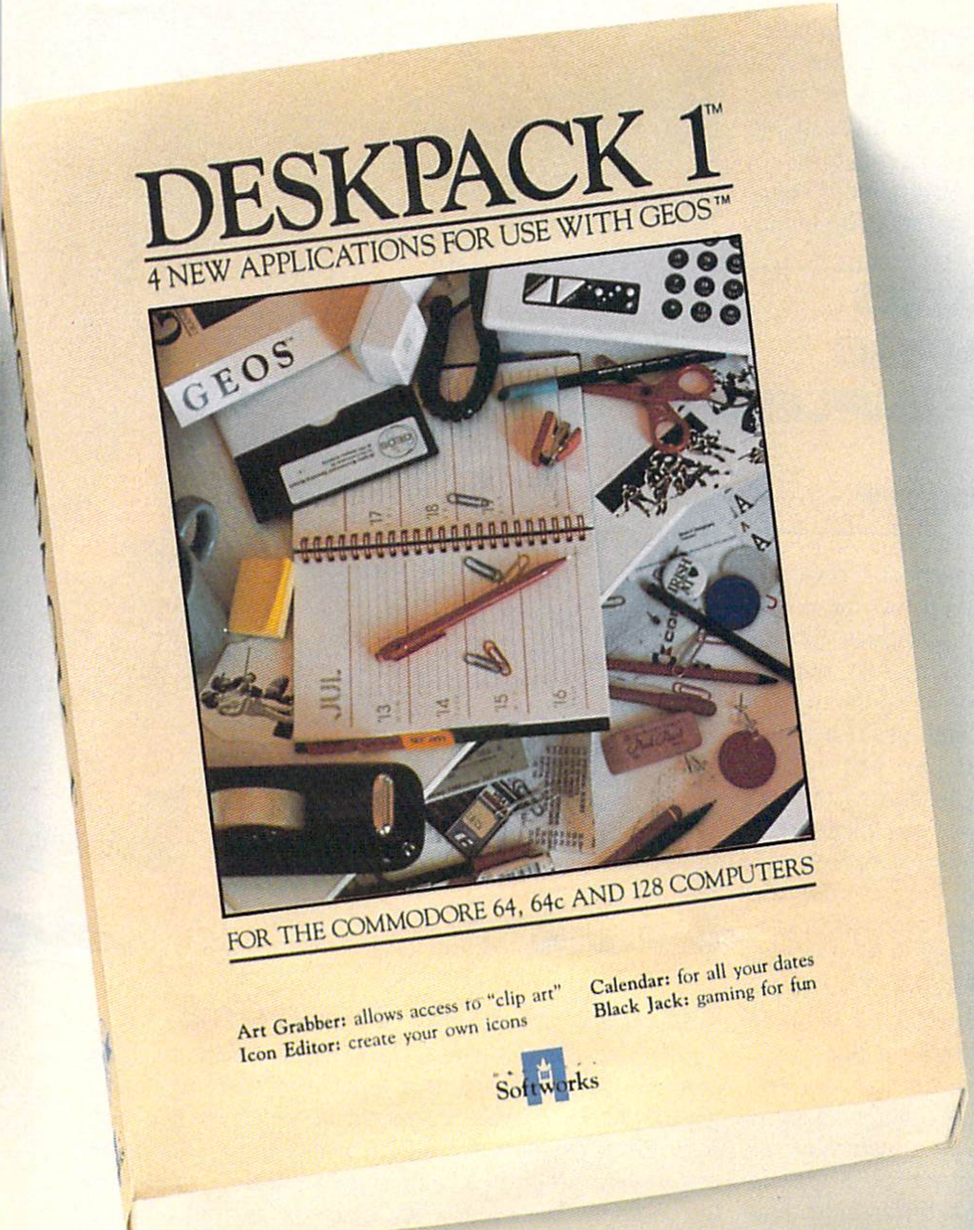
**Look what we found in your desk.** You know how there's always one drawer in your desk that's filled with really neat stuff? Well, GEOS has one of those, too.

It's called Desk Pack.

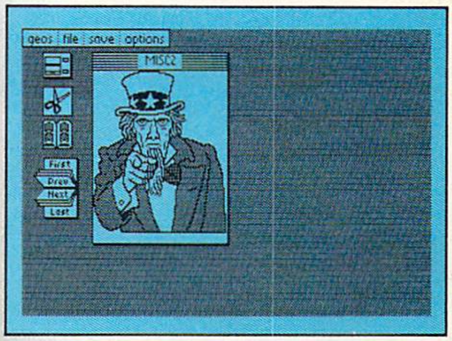
The ingenious Desk Pack Graphics Grabber copies graphics from clip art galleries like Print Shop, Print Master and Newsroom for use in geoWrite and geoPaint.

The Desk Pack Calendar pops up whenever you need to plan your schedule. And since it's valid until the year 9999, you'll never have to miss one of those swell family

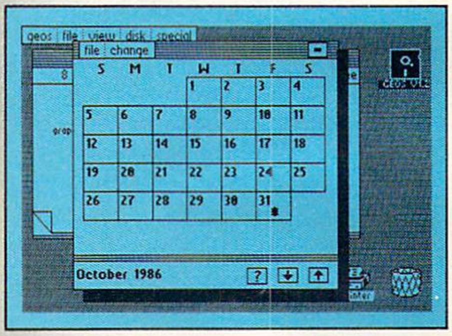
# IS EXPANDING.




**New discoveries reported.** The GEOS universe is expanding. And we'll report each new discovery to you as it occurs.




In the meantime, add Desk Pack and Font Pack to your GEOS system. And see how much you can explore.




reunions ever again.

There's even an Icon Editor, which lets you customize your GEOS file icons with the graphic of your choice.

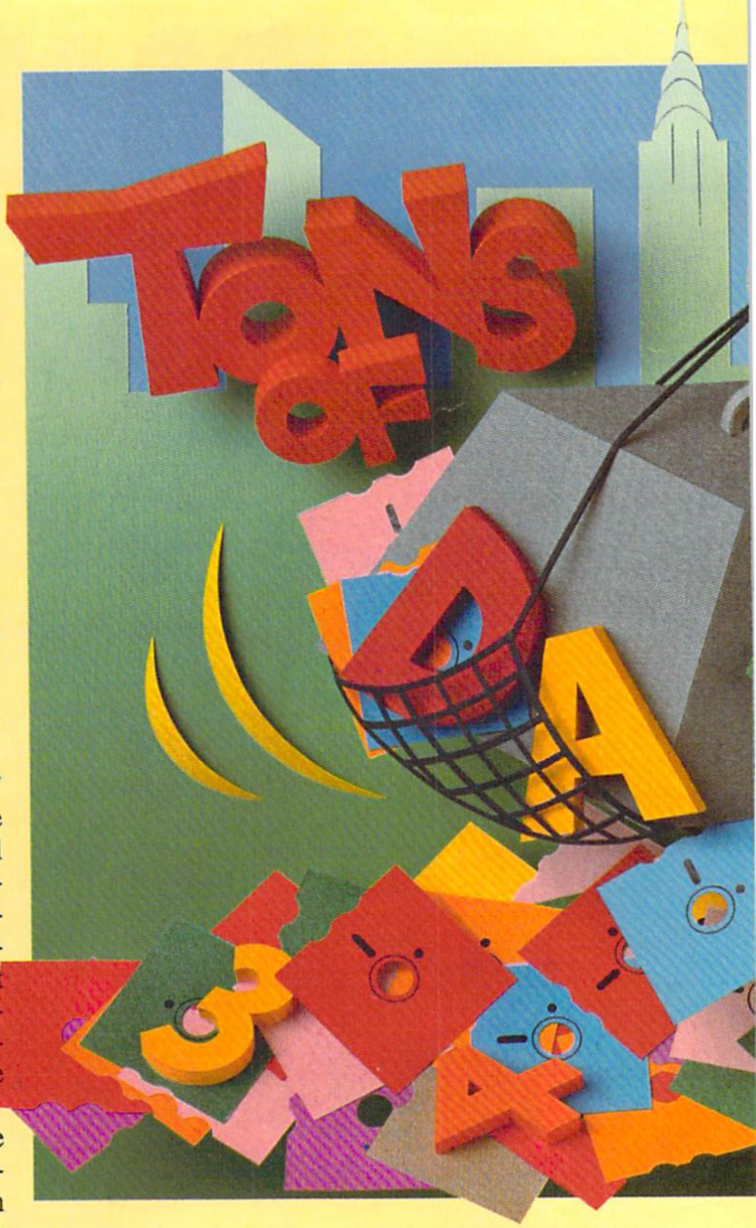
And when you can't deal with work, Desk Pack deals the sharpest Black Jack game this side of Vegas, complete with graphics and sound effects.

*To order, call 1-800-443-0100 ext. 234*
**Font Pack $29.95 Desk Pack $34.95**
(California residents add 6.5% sales tax.)
$2.50 US/$5.50 Foreign for shipping and handling. Allow six weeks for delivery.
Commodore 64 and C64 are trademarks of Commodore Electronics, Ltd. GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo and Berkeley Softworks are tradenames of Berkeley Softworks.

Reader Service No. 148

**Berkeley Softworks**

**The brightest minds are working at Berkeley.**




# GETTING AND TAMING LARGE AMOUNTS OF INPUT

## BY DALE RUPERT

Data file handling is one aspect of computer programming which many people avoid for one reason or another. The concept of "files" is often deemed mysterious or difficult. In fact it is neither, and this month we will prove it.

In the October *Rupert Report* we converted our computers into digital oscilloscopes. We looked at the inputs to the computer's analog-to-digital circuitry on a real-time basis. That is, the display on the screen was the actual value of the input at that instant. One significant advantage of digital oscilloscopes over their analog counterparts is the ability of digital scopes to record the incoming signal values for future reference and for further "not in real time" processing. This month, we will investigate the use of sequential disk files for storing and recovering numerical data. That way we can accumulate information and process it at our convenience.

Files are simply collections of data. Program files are familiar to everyone who has ever saved or loaded a program. Sequential files are slightly different in format from program files, but we need not be concerned about the file structure. BASIC provides commands to let us easily write data into a sequential file and read it back.

The name "sequential" comes from the fact that any data item is accessible only after reading through all items written before that one. Cassette files are naturally sequential in structure. The third program on a tape is reachable only after the recorder reads through the first two programs.

An alternative to sequential files is relative or random access files. The disk drive is capable of picking out various portions of the diskette in any order. With relative files, a program can call up the fortieth data item in the file without looking at any other items. On the other hand, a program can read the fortieth data item of a sequential file only by first reading the preceding thirty-nine.

For real-time data collection, the use of sequential files is not a disadvantage. If the data items must be randomly accessed in order to process them, we can read the data from the disk into arrays in memory which will allow random access.

### THE ART OF DATA COLLECTION

If you wished to monitor the amount of light reaching one side of your house over a period of several weeks, you might set up your computer as a data logger. You could adapt the photocell arrangement we used last month and write a program to read a light intensity value into the computer once every half hour, for example. If you were interested in more rapid fluctuations in brightness, you could program the computer to read the photocell as quickly as possible.

This incoming data must be stored somewhere. The two most common storage areas are random access memory (RAM) and diskettes. If the quantity of data is not too large, and if the computer will not be shut off before the data can be interpreted or processed, a numerical array in RAM would work fine. Variable storage RAM in the C-128 is limited to an array of roughly 32,000 integer numbers, and it is much less than that on the C-64. Integers in an array use two bytes apiece, and the C-128 has on the order of 64,000 bytes of variable storage.




CONSTRUCTION: AJIN

If a BASIC program brings in ten photocell readings per second, C-128 RAM could store approximately one hour's worth of integer data in an array. If more readings are needed, the present readings must be processed first or written to disk to make room.

The 1541 format, single-sided disk stores roughly 170,000 bytes. At first glance, this seems like nearly three times the storage capacity of variable RAM. In actuality, looks are deceiving. Unfortunately integers are not stored on disk as efficiently as in RAM arrays. Numeric data is stored in ASCII format on disk. For example, the integer "125" takes up six bytes in a disk sequential file. It looks like this:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| disk data | > | 32 | 49 | 50 | 53 | 32 | 13 |
| meaning | > | sp | 1 | 2 | 5 | sp | cr |

There is a space (CHR$(32) ) stored ahead of the 1, then the three digits, followed by another space, and a carriage return (CHR$(13) ) which separates this integer from the next one.

An integer such as 12,345 uses only two bytes of a RAM integer array, but it fills eight bytes of a sequential file. The array stores integers ranging from −32768 to +32767 in hexadecimal format; for example, 12,345 in hex is stored as the two bytes 30 39, since $3039 equals 12345. (The leading dollar sign indicates a hexadecimal or base-16 number.) Adding the two spaces and the carriage return to the 5 digits brings the ASCII character total to eight needed to store 12,345 in a disk file.

So why use the disk for data storage? The main reason is that the disk is non-volatile. That means the data is still around even after the power to the computer is shut off. Also, several disks may be used to accumulate several days' worth of data. The program to analyze the data would read from one disk, perform the analysis, and request the next disk to be inserted.

Disk storage is not foolproof however. If the power goes off before a disk file has been properly closed, some or all of the data may be inaccessible. The only way to avoid

# "We speak your language"

Make your BASIC programs
**ZOOM**
Convert them to high-speed machine language
**BASIC Compiler**

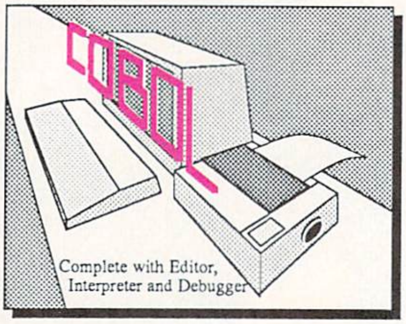
**BASIC Compiler**
*Complete* BASIC compiler and development package. Speed up your programs 5x to 35x. Compile to machine code, compact p-code or both. '128 version: 40 or 80 col. monitor output and FAST-mode operation. '128 version includes extensive 80-page programer's guide. A great package that no software library should be without. **C-128 $59.95** **C-64 $39.95**

C *Language*
Learn the the language of the 80's and beyond
on your C-128 and C-64

**Super C Compiler**
For school or software development. Learn the C language on the '64 or '128. Compiles into *fast* machine code. Added '128 features: CP/M-like operating system; 60K RAM disk. Combine M/L & C using CALL; 51K available for object code; Fast loading; Two standard I/O librarys plus math & graphic libraries. **C-128 $59.95** **C-64 $59.95**

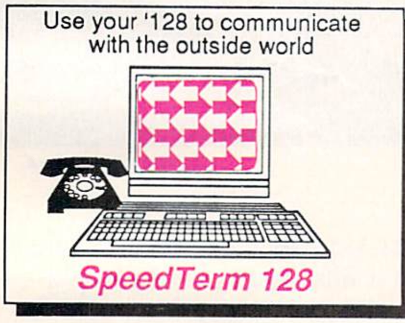



**Super Pascal Compiler**
Not just a compiler, but a complete system for developing applications in Pascal–with graphics. Extensive editor with search, replace, renumber, etc. Standard J & W compiler that generates machine code. High-speed disk access. 48K RAM is available. If you want to learn Pascal or to develop software using the best tools available–**Super Pascal** is your first choice. **C-64 $59.95**

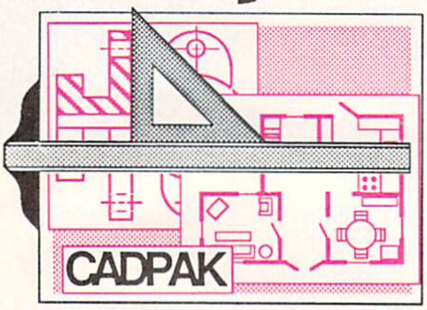



**COBOL**
Now you can learn COBOL, the most widely used commercial programming language, on your 128 or 64. COBOL Compiler package comes complete with syntax-checking editor, interpreter and symbolic debugging aids. New '128 version works with 40/80 column monitors and is quicker than the '64 version. **C-128 $59.95** **C-64 $39.95**

# ... and work hard for you, too!




***Speedterm-128***
Let your C-128 communicate with the outside world. Obtain information from various computer networks. Flexible, command driven terminal software package. Supports most modems for the C-128. Xmodem and Punter file transfer protocol. VT52/100 terminal emulation with cursor keys, large 45K capture buffer & user definable function keys. **C-128 $39.95**




**Cadpak**
Easy-to-use interactive drawing package for accurate graphic designs. Dimensioning features to create exact scaled output to all major dot-matrix printers. Input via keyboard or lightpen. Two graphic screens for COPYing from one to the other. DRAW, BOX, ARC, ELLIPSE, etc. available. Define your own library of symbols/objects–store up to 104 separate objects. **C-128 $59.95** **C-64 $39.95**

**Personal Portfolio Manager**
Complete portfolio management for the individual or professional investor. Manage portfolios, get up-to-the-minute quotes & news, and perform selected analysis. Enter quotes manually or through Warner. **C-128 $59.95 C-64 $39.95**

**Technical Analysis System**
Sophisticated charting and analysis system for investors. Chart and analyze the history of a stock. Pinpoint trends and patterns to predict a stock's future. Enter data via keyboard or online financial services. **C-128 $59.95 C-64 $59.95**

**Chartpak**
Easily create professional high-quality charts and graphs without programming. Immediately change the scaling, labeling, axis, bar filling, etc. to suit your needs. Accepts data from CalcResult and MultiPlan. **C-128 $39.95 C-64 $39.95**

**Xper**
XPER is the first "*expert system*" for the C-128 and C-64. While ordinary data bases are good for reproducing facts, XPER can derive knowledge from a mountain of facts and help you make expert decisions. Large capacity. **C-64 $59.95**

Commodore 64® and Commodore 128™ are trademarks of Commodore Electronics Ltd.

Call **now** for the name of your nearest dealer. Or order directly using your MC, Visa or Amex card. Add $4.00 per order for shipping. Foreign orders add $10.00 per book. Call now or write for your free catalog–also contains information on our C-64 books and software. Dealers inquires welcome—over 1400 dealers nationwide.

**Abacus**
P.O. Box 7219 Dept. HB Grand Rapids, MI 49510
Phone 616-241-5510 • Telex 709-101 • Fax 616-241-5510

power failure related data losses is to use a battery backed up, uninterruptible power supply (and, yes, even they have been known to fail).

With the 1571 disk drive using double-sided disks, the data storage capacity is essentially twice as great as the single-sided drive. Keep in mind that with a single disk drive system it is best to fill only part of a diskette with raw data if the data is to be processed (sorted, filtered, and so forth) and saved. That way there is room for the computer to store the processed data on the same disk. Swapping diskettes during processing is possible but cumbersome.

When time is no object, a cassette tape file might be considered for storing large amounts of raw data. The procedures for using tape are essentially the same as those we will discuss below for disk storage. For the details, you are on your own. (Once a person has used a disk drive, he generally wants to have as little as possible to do with standard tape storage, and rightfully so. Cassette storage is to computers as first gear is to cars. They are fine for starting out, but to cover a significant distance in a reasonable time, you need something else.) Generally disk storage, even with multiple disks, is a better approach than using cassettes.

## READING, WRITING, AND FILES

All it takes to create a sequential disk file are three steps:

1. Open the file
2. Write to the file
3. Close the file

The BASIC 7.0 implementation to these steps is not much more difficult than their statement. The corresponding commands to put the numbers 1 through 100 into a sequential file called "NUMBERS" are simply:

```
1 DOPEN#8,"NUMBERS",W
2 FOR N=1 TO 100 : PRINT#8,N : NEXT N
3 DCLOSE
```

On the C-64, BASIC 2.0 requires a few more "things" and has a slightly different syntax, so the three steps are thus:

```
1 OPEN 8,8,8,"NUMBERS,S,W"
2 FOR N=1 TO 100 : PRINT#8,N : NEXT N
3 CLOSE 8
```

Line 1 in each case needs a little explanation. Opening a file allows the computer to get prepared for the data which will be stored in the file. The 8's following each type of OPEN statement in the two examples are labels called "logical file numbers." The computer prefers numbers to names. When you tell the computer to PRINT a value into the file in line 2, you refer to the file by its number, not by the filename "NUMBERS".

Any number from 1 to 127 may be used for the logical file number. I used 8 for the C-128 from habit since the C-64 requires two other numbers after the OPEN statement. The middle number in the C-64 version must be an 8 to


EXCITING NEW PRODUCTS FROM KIRA CORP.

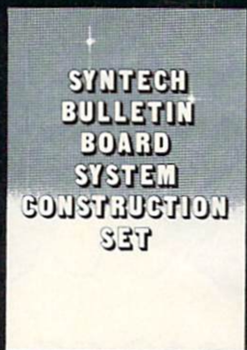
The BASIC 7.0 Compiler

UNPROTECTED.
C128
$59.95




The Programming Tool Kit

UNPROTECTED.
C64/C128
$39.95




SYNTECH BBS
CONSTRUCTION SET

To See In Action Call:
(217) 356-0044 or
(217) 893-3772

C64 $49.95

GNOME SPEED
The BASIC 7.0 Compiler will transform virtually any Basic program into pseudo code that will be up to 50 percent smaller and up to 10 times faster than standard BASIC. GNOME SPEED extends the power of BASIC by optimizing math functions and allowing the use of polar coordinates with graphics commands. The compiler also provides a full range of directives to create variable lists, to include BASIC line numbers in the compiled program or to create a line number/memory address cross-reference file on disk.

GNOME KIT
The programming tool kit is a comprehensive set of utilities that provides an unmatched range of features for BASIC and MACHINE LANGUAGE programming and Direct Access DOS manipulation. BASIC enhancements include an extended DOS Wedge and commands to FIND, MERGE, APPEND and RENUMBER Programs. The extended Machine Language Monitor provides standard commands, plus Block Moves, Breakpoints, Insertion and Deletion of code, and REM routines.

SYNTECH BBS
The SYNTECH BBS features menus that will suit almost any implementation, allowing you to completely customize Menus, Command Letters and Names, Prompts, Short Responses, Bulletins, Special Status, and Access Levels. The system is completely menu driven, making it easy for both Users and System Operators.
For Uploads and Downloads, SYNTECH supports Punter, Xmodem and ASCII/DFT protocols—at 300 or 1200 bips, on almost any combination of disk drives and modems.

24-hour Order Line: (215) 683-5433

BRiWALL
Solid Products ■ Solid Support
P.O. Box 129 Kutztown, PA 19530

Dealer Inquiries: Micro Pace, Inc. (217) 356-1885

Reader Service No. 175

refer to the first disk drive. Rather than remember which number is which, I simply use all 8's since that works. If we were writing data to several files at a time, we would open each one separately with its own filename and its own logical file number. The third number in the C-64 version OPEN statement must be between 2 and 14, and it must be different for two files at the same time.

The "S" stands for "sequential" and is implied in BASIC 7.0. The "W" is required in both versions of BASIC to indicate that we will write to the file. Notice that one W is inside the quotation marks, and the other one is outside.

The PRINT# statement does the writing. *Do not* put a space between the T and the #, and do not use the question mark abbreviation for this statement. "?#" and PRINT #" do not generate the same token as "PRINT#". The PRINT# (read "print number" or "print pound") statement writes to disk files in about the same way that PRINT writes to the screen. If we put a semicolon at the end of line 2, each number would be written without a carriage return after it. Unfortunately that makes it harder to read the individual numbers back.

Reading the numbers we have just written is also a three step process:

4 Open the file
5 Read from the file
6 Close the file

Once again, there is nothing very difficult or involved. The BASIC 7.0 (C-128) implementation looks like this:


**SEXTEX**™ The nation's leading erotic computer communications network



$12.95 LIFETIME MEMBERSHIP

All you need is a computer with a modem to experience the thrill of online adult communications. SEXTEX™, the nation's fastest growing full service videotex network, features live interactive "Chatting", electronic mail and much more. Call or write for a FREE brochure—your computer will never be the same.

**CVC ONLINE**
**dept. A**
**801 Second Ave.,**
**N.Y., N.Y. 10017**
**(212) 972-4719**

Reader Service No. 176


```
4 DOPEN#8,"NUMBERS"
5 DO : INPUT#8,X : PRINT X : LOOP UNTIL
ST=64
6 DCLOSE
```

and here is the BASIC 2.0 version:

```
4 OPEN 8,8,8,"NUMBERS,S"
5 INPUT#8,X : PRINT X : IF ST<>64 THEN G
OTO 5
6 CLOSE 8
```

The "S" in the OPEN statement is optional and may be used in the BASIC 7.0 version if desired. The INPUT# statement works the same way as the more familiar INPUT statement. Line 5 causes the computer to read up to the first carriage return from the file associated with logical file number 8, the "NUMBERS" file. In general, to read data from a file, the format of the INPUT# statement should be the same as the PRINT# statement which wrote it. The PRINT statement merely puts this data onto the screen so that we know the program is working. Instead of the PRINT statement we could put additional computational statements here, if desired.

## CHECKING STATUS

After the last value was written and the file was closed in lines 1 through 3, the computer added a special character to identify the end of the file. BASIC uses a special status variable ST to identify the outcome of input and output (I/O) operations such as to the printer and the disk. As long as everything is normal, the value of ST is 0.

Once the computer reads the last value in the file, it sets the value of ST to 64. Line 5 in both programs checks the value of ST to decide whether to go back for more data.

There is one special consideration about the ST variable. It can be read only once to indicate the status of each I/O operation. Once it is read, it is reset to zero. Therefore if several parts of a program need to know the value of ST for a given I/O operation, its value must be read once and stored in a separate variable. We'll see an example of this later.

One further caution. If for some reason the program to write or read disk files is interrupted and the "disk drive active" light is left on, you should close any files which were opened. On the C-128 simply type DCLOSE to close all open files. On the C-64 you must type CLOSE n for each logical file number n which is open. The drive light should then go off.

## TAKING CARE OF ERRORS

The programs *Datawriter* and *Datareader* are meant to be models for creating your own file access programs. There are versions for the C-128 and for the C-64 beginning on page 127). If you understand the simple examples above, these programs should not be difficult to interpret. The line numbers for the two versions are the same, so our discussion will apply to both versions, except as noted.

The filename may be stored in a variable rather than being given directly. Notice the syntax in line 30 for using

# Software Discounters of America

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

S.D. of A

**Open Saturday**

- Free shipping on orders over $100 in continental USA
- No surcharge for VISA/MasterCard
- Your card is not charged until we ship

**ABACUS**
Basic 128
Cad Pak 64
Cad Pak 128
Chart pak 128
Cobol 64
Personal Portfolio Mgr. 64
Power Plan 64
Super C 128
Super Pascal 64
CALL FOR PRICES
**ACCESS**
Executive Leader Board Data Disk ........ $14
Leader Board Golf (D) $25
Leader Board Tourn. Disk #1 .... $14
Mach 5 (R) ........ $23
Mach 128 (R) ........ $33
Tenth Frame (D) .... $25
**ACTIVISION**
Alter Ego (Male or Female) ........ $33
Gamemaker Library Disks
Sports ........ $14
Sci Fi ........ $14
Garry Kitchen's Gamemaker (D) ... $25
Hacker 2 (D) ........ $23
Little Computer People (D) ........ $23
Music Studio (D) .... $23
Murder on the Mississippi (D) ... $23
**ACCOLADE**
Ace of Aces (D) ..... $19
Dambusters (D) ..... $19
Deceptor (D) ........ Call
Fight Night (D) ..... $19
Hard Ball (D) ........ $19
Law of the West (D) .. $19
PSI-5 Trading Co. (D) $19
**AMERICAN EDUCATIONAL**
Biology (D) ........ $12
French (D) ........ $12
Grammar (D) ........ $12
Science: Grades 3/4(D) $12
Science: Grades 5/6(D) $12
Science: Grades 7/8(D) $12
Spanish (D) ........ $12
U.S. Geography (D) .. $12
World Geography (D) $12
World History (D) ... $12
**ARTWORX**
Beach Blanket Volleyball (D) ..... $12
Bridge 4.0 (D) ........ $16
Equestrian Show Jumper (D) ........ $12
Strip Poker (D) ..... $21
Data Disk #1 female $16
Data Disk #2 male ... $16
Data Disk #3 female $16
**ARTWORX PX**
Hole In One Golf (D) .. $7
Pro Boxing (D) ........ $7
**AVALON HILL**
Super Bowl Sunday (D) ........ $19
SBS 1984 Team Disk $14
SBS 1985 Team Disk $14
SBS Champs Disk ... $14
Spitfire '40 (D) ........ $23
Title Bout (D) ........ $19
Tournament Golf (D) $19
**BATTERIES INCLUDED**
Consultant (64 or 128) $39
Home Pak (D) ........ $33
Paperclip w/Spell 64 or 128 ........ $49
Paperclip II 128 ..... $49
**BERKELEY SOFTWORKS**
Geos (D) ........ $39
*Geos Desk Pak (D) . $19
*Geos Font Pak (D) .. $19
*Geos add-on programs only!*
**BRODERBUND**
Bank St. Filer (D) .... $33
Bank St. Mailer (D) .. $33
Bank St. Writer (D) .. $33
Bank St. Speller (D) .. $33
Breakers (D) ........ $25
Carmen Sandiego (D) $23
Print Shop (D) ........ $26
P.S. Companion (D) .. $23
P.S. Graphics Library #1, #2, or #3 ... $16 Ea.
P.S. Graphics Library Holiday Edition ... $16
Type! (D) ........ $25
**CARDCO**
Calc Now (D) ........ $14
File Now (D) ........ $14
Graph Now (D) ........ $14
Mail Now (D) ........ $14
Write Now (R) ........ $19
**CBS**
Argos Expedition (D) . $9
Big Bird Spc. Del. (R) . $9
Dream House (D) ..... $9
Ernie's Big Splash (D) $9
Grover's Animal Adventures (D) .... $9
Mastering the SAT (D) $44
Math Mileage (D) ..... $9
Movie Musical Madness (D) ........ $9
Railroad Works (D) ... $9
Rich Scarry's Electronic Word Book (D) .... $12
Sesame St. Pals Around Town (D) ... $9
Success w/Algebra . Call
Success w/Math ..... Call
Timebound (D) ........ $9
Weather Tamers (D) .. $9
**CDA**
America Cooks Series:
American (D) ..... $9.95
Chinese (D) ..... $9.95
French (D) ...... $9.95
Italian (D) ...... $9.95
Mexican (D) ..... $9.95
**CMS**
General Acct. 128 .. $119
**DATA EAST**
Commando (D) ..... $23
Karate Champ (D) ... $23
Kung Fu Master (D) .. $23
Tag Team Wrestling (D) $23
**DAVIDSON**
Math Blaster (D) ..... $33
Spell It (D) ........ $33
Word Attack (D) ..... $33
**DIGITAL SOLUTIONS**
Pocket Filer 128 ..... $33
Pocket Planner 128 .. $33
Pocket Writer 64 ..... $25
Pocket Writer 128 ..... $33
**ELECTRONIC ARTS**
Adv. Const. Set (D)
Amnesia (D)
Archon 2: Adept (D)
Bard's Tale (D)
Bard's Tale 2: The Destiny Knight (D)
Chessmaster 2000 (D)
Heart of Africa (D)
Lords of Conquest (D)
Mail Order Monsters (D)
Movie Maker (D)
Music Const. Set (D)
One-on-One (D)
Pinball Const. Set (D)
Racing Dest. Set (D)
Seven Cities of Gold (D)
Skyfox (D)
Super Boulder Dash (D)
Timothy Leary's Mind Mirror (D)
Ultimate Wizard (D)
*Prices too low to advertise!!* ..... *Call*
**EPYX**
Barbie (D) ........ $9
Breakdance (D) ........ $9
Champ. Wrestling (D) $19
Destroyer (D) ........ Call
Fast Load (R) ..... $19.95
Impossible Mission (D) . $9
Movie Monster (D) .... $23
Multiplan 128 ........ $39
Pitstop II (D) ........ $9
Summer Games 2(D) $19.95
Super Cycle (D) ... $19.95
Temple of Apshai Trilogy (D) ........ $23
Winter Games (D) . $19.95
World Championship Karate (D) ..... $17.95
World Games (D) ..... $23
**FIREBIRD**
Colossus Chess 4 (D) $23
Elite (D) ........ $19
Frankie Goes to Hollywood (D) .... $23
The Pawn (D) ........ $29
**FISHER PRICE**
Alpha Build (R) ........ $7
Dance Fantasy (R) .... $7
Hop Along Counting (R) ........ $7
Linking Logic (R) ..... $7
Memory Manor (R) ..... $7
Number Tumbler (R) .. $7
Sea Speller (R) ........ $7
**GAMESTAR**
Championship Baseball '86 (D) ... $23
Champ. Basketball (D) $23
Star Rank Boxing (D) $19
**HAYDEN**
Sargon 3 (D) ........ $25
**HES**
Microsoft Multiplan (D) $19
Millionaire (D) ........ $12
Omniwriter w/Spell (D) $23
Project Space Station (D) ........ $19
**HI-TECH EXPRESSIONS**
Card Ware (D) ........ $7
Heart Ware (D) ........ $7
Party Ware (D) ........ $12
Ware w/all Supply Kit ........ $12
**INFOCOM**
Ballyhoo (D) ........ $25
Cut Throats (D) ...... $23
Enchanter (D) ........ $23
Hitchhiker's Guide to the Galaxy (D) .... $23
Infidel (D) ........ $25
Leather Goddesses of Phobos (D) ........ $23
Moonmist (D) ........ $23
Planetfall (D) ........ $23
Sorcerer (D) ........ $25
Suspect (D) ........ $25
Trinity 128 ........ $25
Wishbringer (D) ..... $23
Zork 1 (D) ........ $23
Zork 2 or 3 (D) ........ $25
**INTRACORP**
Intracourse (Compatibility & Analysis Modules) $65
Intracourse (Compatibility Module) ........ $33
Intracourse (Analysis Module) ........ $39
**MASTERTRONIC**
Action Biker (D) ........ $7
Electra Glide (D) ........ $7
Gates of Dawn (D) .... $7
Infinity Machine (R) . $19
Kikstart (D) ........ $7
5-A-Side Soccer (D) .. $7
Last V-8 (D) ........ $7
Master of Magic (D) .. $7
Ninja (D) ........ $7
Speed King (D) ........ $7
The Slugger (D) ........ $7
Vegas Jackpot (D) .... $7
**MICROLEAGUE**
Baseball (D) ........ $25
Box Score Stats (D) . $16
General Manager (D) $25
1985 Team Data Disk $14
**MICROPROSE**
F-15 Strike Eagle (D) $23
Gunship (D) ........ $23
Kennedy Approach (D) $17
Silent Service (D) .... $23
**MINDSCAPE**
Bank St. Music Writer (D) ........ $19
Bank St. Storybook (D) $19
Bop & Wrestle (D) ... $19
Color Me: The Computer Coloring Kit (D) ... $19
Fairlight (D) ........ $19
Great British Software (D) ........ $12
Infiltrator (D) ........ $19
Perfect Score SAT (D) $44
Spell of Destruction (D) $19
The American Challenge Sailing Simulation (D) $19
**MISC**
CSM 1541 Align Kit (D) ........ $29
Central Point Copy 2 (D) ........ $23
Gato (D) ........ $19
Snapshot 64 (R) .... Call
Superbase 64 (D) ..... $47
Superbase 128 (D) .... $59
Superscript 64 (D) .... $47
Superscript 128 ........ $47
VIP Term XL (D) ..... $33
**ORIGIN**
Ultima 3 (D) ........ $34
Ultima 4 (D) ........ $39
**PENGUIN/POLARWARE**
Crimson Crown (D) .. $12
Graphics Magician Painter (D) ........ $16
Oo-Topos (D) ........ $12
Transylvania (D) ..... $12
**PROFESSIONAL SOFTWARE**
Fleet System 2—W.P. w/70,000 word spell checker 64 or 128 . $39
Fleet System 3 (128) . $49
**RANDOM HOUSE**
Charlie Brown's ABC's (D) ........ $12
Snoopy's Reading Machine (D) ...... $12
Snoopy Writer (D) .... $12
Typing Is A Ball, Charlie Brown (D) .. $12
**SCARBOROUGH**
Boston Computer Diet (D) ........ $23
Build A Book (D) ..... $16
Mastertype (D) ........ $25
Net Worth (D) ........ $39
**SIERRA**
Champ. Boxing (D) ... $16
Donald Duck's Playground (D) .... $16
Homeword Plus w/Speller (D) ........ $33
Mickey's Space Adv. (D) $16
Stunt Flyer (D) ........ $16
Winnie The Pooh (D) . $16
Wiz Type (D) ........ $16
**SIMON & SCHUSTER**
Chem Lab (D) ........ $25
Great International Paper Airplane Construction Set (D) $19
Star Trek-The Kobayashi Alternative (D) ..... $25
Typing Tutor 3 (D) .... $25
**SPINNAKER**
ACE: Air Combat Emulator (D) ........ $14
Adventure Creator (R) $9
Alphabet Zoo (R) ..... $9
Alf in Color Cave (R) .. $9
Delta Drawing (R) .... $9
Facemaker (R) ........ $9
Fraction Fever (R) .... $9
Homework Helper—Math Word Problems (D) ..... $23
Homework Helper—Writing (D) ........ $23
Invaders Lost Tomb (D) $19
Kids on Keys (R) ..... $9
Kung Fu 1—Exploding Fist (D) . $19
Kung Fu 2—Sticks of Death (D) $19
**SPRINGBOARD**
Certificate Maker (D) $33
Newsroom (D) ........ $33
N.R. Clip Art Vol. 1 (D) $19
N.R. Clip Art Vol. 2 (D) $25
N.R. Clip Art Vol. 3 (D) . Call
P.S. Graphics Expander (D) ..... $23
**SSI**
Battle Group (D) ..... $37
Battle of Antietam (D) $33
Colonial Conquest (D) $25
Field of Fire (D) ..... $25
Gemstone Warrior (D) $23
Gettysburg (D) ........ $37
Kampfgruppe (D) ..... $37
Mech Brigade (D) .... $37
NAM (D) ........ $25
Phantasie (D) ........ $25
Phantasie 2 (D) ....... $25
Questron (D) ........ $25
Rings of Zilfin (D) .... $25
Roadwar 2000 (D) .... $25
Shard of Spring (D) .. $25
U.S.A.A.F. (D) ........ $37
Wings of War (D) .... $25
Wizard's Crown (D) .. $25
**SUBLOGIC**
Baseball (D) ........ $32
Flight Simulator 2 (D) . $32
F.S. Scenery Disks .. Call
Football (D) ........ $29
Jet (D) ........ $29
**TELARIUM**
Amazon (D) ........ $9
Fahrenheit 451 (D) .... $9
Dragon World (D) .... $9
Nine Princes in Amber (D) ........ $21
**TIMEWORKS**
Accts. Payable (D) .. $39
Accts. Receivable (D) $39
Data Manager 2 (D) .. $33
Data Manager 128 ... $43
Evelyn Wood Dynamic Reader (D) $33
General Ledger (D) .. $39
Inventory Mgmt (D) .. $39
Partner 64 (R) ........ $39
Partner 128 (R) ........ $43
Payroll Mgmt. (D) .... $39
Sales Analysis Mgmt (D) ........ $39
Swiftcalc/Sideways (D) $33
Swiftcalc/ Sideways (128) ... $43
Sylvia Porter's Personal Fin. Planner 64 (D) $33
Sylvia Porter's Personal Financial Planner 128 ........ $43
Word Writer w/ Speller (D) ........ $33
Word Writer w/85000 Word Speller (128) $43
**UNISON WORLD**
Art Gallery 1 (D) ..... $16
Art Gallery 2 (D) ..... $16
Print Master (D) ..... $23
**WEEKLY READER**
Stickybear ABC's (D) $16
Stickybear Math (D) . $16
Stickybear Numbers (D) $16
Stickybear Reading (D) $16
Stickybear Shapes (D) $16
**WINDHAM CLASSICS**
Alice in Wonderland (D) $9
Below the Root (D) .... $9
Swiss Family Robinson (D) ........ $9
Treasure Island (D) .... $9
Wizard of Oz (D) ..... $9
**ACCESSORIES**
Anchor 6420 300 Baud Modem . $49
Bonus SS, DD ... $5.99 Bx
Bonus DS, DD ... $6.99 Bx
Compuserve Starter Kit (a $25 Usage Credit) $19
Disk Case (Holds 50) . $9
Disk Drive Cleaner .... $9
Sakata 13" Color Comp. Monitor for C64 .. $139
Seikosha SP1000VC 100 CPS Commodore direct connect dot matrix printer ........ $179
Wico Bat Handle ..... $17
Wico Black Max ...... $9
Wico Boss ........ $12

**Hours:** Eastern Time
**Mon.-Fri.** 9AM-5:30PM
**Sat.** 10AM-4PM

**P.O. BOX 11327—DEPT. AY—BLAWNOX, PA 15238**

***Please Read The Following Ordering Terms & Conditions Carefully Before Placing Your Order:** Orders with cashiers check or money order shipped immediately. Personal & Company checks allow 3 weeks clearance. NO C.O.D.'s! **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100. AK, HI, FPO, APO—add $5 on all orders. Canada & Puerto Rico—add $10 on all orders.** Sorry, no other international orders accepted! **PA residents add 6% sales tax on the total amount of order including shipping charges!** Prices subject to change without notice. **REASONS FOR CALLING CUSTOMER SERVICE—412-361-5291 (1)** Status of order or back order **(2)** If any merchandise purchased within 60 days from S.D. of A. is defective, please call for a return authorization number. Defective merchandise will be replaced with the same merchandise only! NO CREDITS! After 60 days please refer to the manufacturers warranty included with the merchandise & return directly to the manufacturer. **Customer service will not accept collect calls or calls on S.D. of A.'s 800# order lines!**

Reader Service No. 180

the variable filename F$. In addition to the I/O status variable ST, the C-128 has another set of special variables, DS and DS$, which store information about the disk drive status. If our attempt to open a file for writing fails, DS will have a code number identifying the problem. DS$ includes the code number as well as an error message and the faulty track and sector if relevant.

The corresponding drive status function on the C-64 involves opening a special file for the disk drive command channel. The drive sends its status to the computer through this channel which is number 15. The first two quantities it transmits are the error number and the error message. These are identical to DS and DS$. Line 40 in the C-64 version shows how to access these values. In essence our program must put the values into DS and DS$. The C-64 computer doesn't do that for us.

Notice that lines 40 and 220 read the drive status error number DS and store it in another variable DD. That way, the error handling routines in lines 1000 and 2000 can also reference the value. Recall that the values are reset each time they are read.

What could cause a disk drive error when line 30 in *Datawriter* opens the output file? The most common causes are that a file with the given filename already exists on the disk, or that the disk hasn't been formatted (use the NEW or HEADER commands), or that the disk drive door is open.

If an error has occurred in opening the file to be written, the program branches to the error handler routine in line 1000. The first thing it does is to close the open file(s). If the error resulted from the file already existing on the disk, DS and DD have a value of 63, and the program branches to line 1030. If the value of DD is not 63, the status variable and the error message are displayed to help the operator figure out the problem, and the program ends.

If the file to be written already exists, the program allows the user to write over (scratch) the old file and to replace it with the new one, or else he may specify a new filename.

If in *Datareader* a drive status error occurs, the most likely reason is that the specified file does not exist on the disk. The user is allowed to specify a different filename or simply to press the RETURN key to exit the program. On the C-128 version, the user may request that the disk directory be displayed so he can see which files exist.

In both programs, the status is checked after each INPUT# or PRINT# statement. If ST is not zero, then something went wrong during the I/O operation, such as the disk door being opened or the drive being unplugged. A status value of −128 means the drive is not present or not ready.

The main loop beginning in line 90 of *Datawriter* simply reads the jiffy timer and writes the square of that value to the file "TIME1." This operation is performed 100 times as controlled by the variable N. You could easily replace line 100 with T2=POT(1) to read the light intensity on a photocell plugged into the C-128's paddle port as described last month. The main loop might be timer-controlled so that the keyboard or an input port is read once every hour for example. A statement comparable to that in line 110 is all that is needed to store data onto the disk.

*Datareader* retrieves the squared jiffy clock values one by one from the disk file if you specify the filename "TIME1." Each value is sequentially numbered and displayed on the screen. Also the difference between the present value in D and the previous value (saved at line 280 in D0) is calculated and displayed. This is merely to show how the incoming data may be processed. Notice that the sequential numbers are displayed as the data is read from the disk. There is no need to store these numbers in the disk file.

You may change the default filenames in lines 20 and 200. The "XX" in line 200 causes the program to automatically branch to the error handler so the actual filename can be entered (assuming your disk does not contain a file called "XX".) You can add additional error handling if necessary, although nothing more is needed to take care of most problems. (Try opening the disk drive door during the file access just to see what happens.)

What you put into the main loops is up to you. Our simple model did not require the use of arrays since only two data values were referenced at a time (the current reading and one previous reading). In future columns we will discuss the use of RAM arrays for processing the data, and we will see some more advanced file reading and writing capabilities. The *Datawriter* and *Datareader* models should help you to implement most data logging applications.

Hopefully by now you are convinced that sequential file operations are not really very difficult. If not, reread this article, study the examples, try them, and then modify them. Very soon you will agree that disk data files are as easy as 1, 2, 3. ☐*SEE PROGRAM LISTINGS ON PAGE 127*


**PROBLEM:**
**YOU CAN'T USE YOUR COMPUTER WHILE YOUR PRINTER PRINTS!**

**SOLUTION:**

**SERIAL BOX™**

**Lets You Compute, While Your Printer Prints!**

**GEOS™ COMPATIBLE**

**If your Commodore system consists of:**
**Commodore Compatible Printer or Printer and Serial Interface**

**SERIAL BOX™ $79.95**
64K Serial to Serial Print Buffer

**If your system consists of:**
**Non-Commodore Printer**

**SERIAL BOX-PLUS™ $149.95**
Serial to Parallel Interface with 64K Print Buffer (Plus FONT FACTORY*)

**If your system consists of:**
**Non-Commodore Printer and Massive Printer Output**

**SERIAL BOX-MAX™ $219.95**
Serial to Parallel Interface with 256K Print Buffer (Plus FONT FACTORY*)
Dealer Inquiries Welcome.

CALL 1-800-228-7264 FOR ORDERS AND INFORMATION
IN PENNSYLVANIA CALL (215) 622-5495 OR WRITE:

**R. J. Brachman Associates, Inc.**
P.O. Box 1077 Havertown, PA 19083



Please add $3.00 for shipping and handling USA (Foreign Extra)
VISA, MC, Check or Money Orders accepted. C.O.D. add $2.50
PA residents add 6% (PLEASE ALLOW 4 TO 6 WEEKS FOR DELIVERY)

*FONT FACTORY is a font design utility program.
GEOS is a registered trademark of Berkeley Softworks
Prices subject to change without notice.

Reader Service No. 177

COMMODORE ROOTS

# THE SHADOW KNOWS

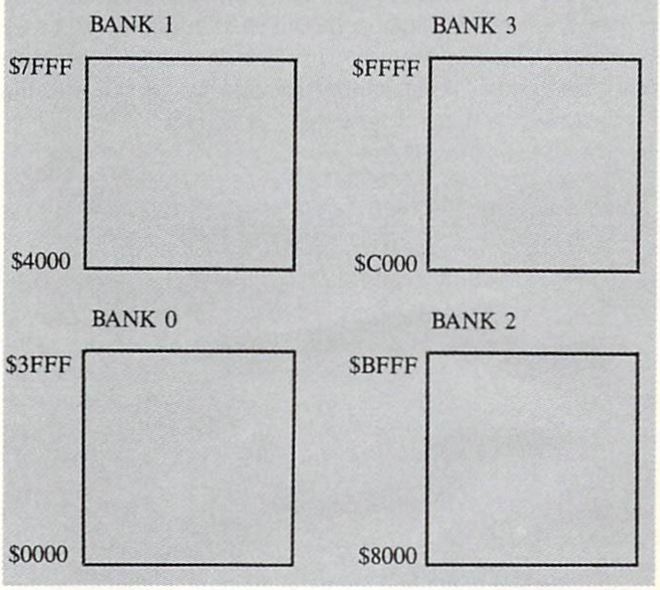
## Exposed: Secrets of Programming Sprites Using the Commodore 128's Shadow Registers

**By Mark Andrews**

There's a secret to programming sprites on the Commodore 128 – and it isn't revealed in the official *C-128 Programmer's Reference Guide.* In fact, to my knowledge, it hasn't been revealed anywhere. But it soon will be – in this series of two columns.

The secret, in a nutshell, is this: Deep in the Commodore 128's memory banks, in an undisclosed and totally undocumented location, is a set of "shadow registers" that determine where sprites will appear on the screen in assembly language programs.

**FIGURE 1**
**The Four Video Banks in Each Memory Bank**




In order to write a sprite program in C-128 assembly language, it is essential to know the addresses and functions of these shadow registers. Without them, you cannot program a sprite in C-128 assembly language. Yet, strangely enough, these registers are not mentioned in the *C-128 Programmer's Reference Guide,* a 744-page technical manual commissioned by Commodore and published by Bantam. And, to date, I have not found them listed in any other book on C-128 assembly language.

### EXPLORING THE SHADOWS

But in this month's and next month's column, we'll actually use the C-128's secret sprite registers to create a sprite and animate it on the screen. We'll do this in an assembly language program that has been divided into two parts, called SPRITE1 (on page 122) and SPRITE2 (next month).

The SPRITE1 and SPRITE2 programs look and work much like a C-64 program that appeared in this column several months ago. Like their predecessor, they display part of a message on the screen in headline-sized characters, and then use a sprite to complete and animate the message. But don't let these similarities fool you. SPRITE1 and SPRITE2 were written strictly for the Commodore 128; because they make use of shadow registers and other special features of the C-128, they will not work on the 64.

Before we start typing and assembling SPRITE 1, it would probably be a good idea to take a look at some of the graphics features of the C-128. So here goes:

### THE C-128'S BANKED ARCHITECTURE

As we have seen in previous columns, the Commodore 128 has two 64K blocks of RAM – sometimes labeled RAM block 0 and RAM block 1 – and one 48K block of ROM. But the C-128's VIC-II video chip, which controls sprites as well as screen graphics, can access only 16K of memory at a time. So each of the C-128's 64K RAM blocks has been divided into four video banks, each containing 16K of memory. And a simple method has been provided for telling the VIC-II which video bank it must access to get the data it needs to generate a screen display.

To direct the VIC-II chip to the proper video bank, all a programmer has to do is set two bits in a certain C-128 register: specifically, bits 0 and 1 of memory register $DD00, sometimes referred to as Complex Interface Adapter Register No. 2, or C12PRA. Figure 1 shows how each of the C-128's two blocks of RAM can be divided into four 16K video banks. And Figure 2 shows how bits 0 and 1 of the C12PRA register can direct the VIC-II chip to any desired video bank within either of the C-128's

**FIGURE 2**
**Selecting a Video Bank Using Register $DD00**

| Video Bank | Address Range | $DD00 Setting | Hexadecimal Equivalent |
|---|---|---|---|
| 0 | $0000-$3FFF | XXXXXX11 | $03 |
| 1 | $4000-$7FFF | XXXXXX10 | $02 |
| 2 | $8000-$BFFF | XXXXXX01 | $01 |
| 3 | $C000-$FFFF | XXXXXX00 | $00 |

64K blocks of RAM.

## HOW TO USE THE C12PRA REGISTER

The C12PRA is an important register in C-128 graphics programs, because it is often necessary to move the block of memory that is accessed by the VIC-II. For example, in the SPRITE1 program, there are three large blocks of graphics-related data: a high-resolution screen, a character set that has been copied from ROM into RAM, and a sprite. Since data from all three of these memory blocks must appear on the screen at the same time, the C-128's VIC-II chip has to have access to all three simultaneously. And that means that all three blocks of data have to be situated in the same 16K video bank in the same 64K block of memory.

**FIGURE 3**
**Altering Register $DD00 by a Masking Operation**

```
LDA C12PRA
AND #$FC ;CLEAR BITS 0 AND 1
ORA #$02 ;USE VIDEO BANK 1
STA C12PRA
```

This condition would not be difficult to fulfill if the VIC-II chip were set to access an empty 16K block of RAM at power-up time. Unfortunately, this is not the case. When the C-128 is turned on, the VIC-II chip is set to access video bank 0 in RAM block 0–and, as it turns out, this is a very crowded block of RAM. It contains Page Zero, the 8502 stack, some RAM used by BASIC, and a big chunk of the C-128's operating system RAM–in all, over 7K of RAM that would be difficult, if not impossible, to use for storage of graphics data.

Fortunately, it is not difficult to rearrange things so that the VIC-II can access a less crowded segment of RAM. In SPRITE1, for example, the C12PRA chip is used to redirect the VIC-II chip to video bank 1 (memory addresses $4000-$7FFF) in RAM block 0.

In lines 412 through 418 of SPRITE1, the 8502 is instructed to access memory bank 15, where the C12PRA register ($DD00) resides. Then bits 0 and 1 of the C12PRA register are set to access video bank 1. A masking operation is used for this procedure, as illustrated in Figure 3.

## THE VMCSB REGISTER

Before the VIC-II chip can produce a screen display, it must also be told exactly where to go in memory to get the screen data and character data which it needs to produce a screen display. In a C-128 program, screen and character data may be placed anywhere the programmer desires–within these limitations:

• A high-resolution screen map must start on a 1K boundary–that is, at a memory address divisible by $0400, or 1024 in decimal notation.

• When a full or partial character set is copied from ROM into RAM, its starting address in RAM must be situated on a 2K boundary–that is, at a memory address divisible by $0800 (or 2048 in decimal).

• If a RAM-based character set is used in a program, both the screen map and the relocated character set must reside in the same 16K video bank in the same 64K block of RAM.

## THE C-128'S SHADOW REGISTERS

If you have written programs for the C-64, you may know that it has one memory register–often called the VMCSB register–that serves as a double function in high-resolution programs. VMCSB, situated at memory address $D018, is an eight-bit register that is used as two four-bit registers. The high byte of $D018 tells the VIC-II chip where it can find data that it needs to generate a screen map. And the low byte directs the VIC-II chip to the segment of memory that contains character data.

In the Commodore 64, setting the MVCSB register is a very straightforward operation. But in the C-128, VMCSB cannot be accessed directly from a user-written program. Instead, it must be addressed through two "shadow registers"–one used when the C-128 is in its 40-column text mode, and one used when the computer is generating high-resolution graphics. In the C-128's 40-column text mode, memory register $A2C is the VMCSB shadow register. In high-resolution graphics mode, the VMCSB's shadow register is memory address $A2D. These two registers are not the secret sprite registers that were mentioned at the beginning of this column. But they work in a similar way: they provide the programmer with access to other registers that are not directly addressable from user-written programs.

**FIGURE 4**
**Text and Low-Resolution Screen-Map Addresses (store starting address code in $A2C as follows:)**

| Bits to Set | Hex No. | Starting Addresses Video Bank 0 | Video Bank 1 | Video Bank 2 | Video Bank 3 |
|---|---|---|---|---|---|
| 1111XXXX | $F0 | $3C00 | $7C00 | $BC00 | $FC00 |
| 1110XXXX | $E0 | $3800 | $7800 | $B800 | $F800 |
| 1101XXXX | $D0 | $3400 | $7400 | $B400 | $F400 |
| 1100XXXX | $C0 | $3000 | $7000 | $B000 | $F000 |
| 1011XXXX | $B0 | $2C00 | $6C00 | $AC00 | $EC00 |
| 1010XXXX | $A0 | $2800 | $6800 | $A800 | $E800 |
| 1001XXXX | $90 | $2400 | $6400 | $A400 | $E400 |
| 1000XXXX | $80 | $2000 | $6000 | $A000 | $E000 |
| 0111XXXX | $70 | $1C00 | $5C00 | $9C00 | $DC00 |
| 0110XXXX | $60 | $1800 | $5800 | $9800 | $D800 |
| 0101XXXX | $50 | $1400 | $5400 | $9400 | $D400 |
| 0100XXXX | $40 | $1000 | $5000 | $9000 | $D000 |
| 0011XXXX | $30 | $0C00 | $4C00 | $8C00 | $CC00 |
| 0010XXXX | $20 | $0800 | $4800 | $8800 | $C800 |
| 0001XXXX | $10 | $0400 | $4400 | $8400 | $C400 |
| 0000XXXX | $00 | $0000 | $4000 | $8000 | $C000 |

## USING MEMORY REGISTER $A2C

With text and low-resolution programs written for the C-128, the default screen map–the block of memory that is used as a screen map when the computer is turned on–extends from $0400 to $07FF in memory bank 0. And the ROM block that holds character data at power-up time

**FIGURE 5**
**RAM Character Set Starting Addresses in Text Mode**
**(store starting address code in $A2C as follows:)**

| Bits to Set | Hex No. | Starting Addresses Video Bank 0 | Video Bank 1 | Video Bank 2 | Video Bank 3 |
|---|---|---|---|---|---|
| XXXX111X | $0E | $3800 | $7800 | $B800 | $F800 |
| XXXX110X | $0C | $3000 | $7000 | $B000 | $F000 |
| XXXX101X | $0A | $2800 | $6800 | $A800 | $E800 |
| XXXX100X | $08 | $2000 | $6000 | $A000 | $E000 |
| XXXX011X | $06 | $1800 | $5800 | $9800 | $D800 |
| XXXX010X | $04 | $1000 | $5000 | $9000 | $D000 |
| XXXX001X | $02 | $0800 | $4800 | $8800 | $C800 |
| XXXX000X | $00 | $0000 | $4000 | $8000 | $C000 |

extends from $D000 to $DFFF in bank 14. In addition, the C-128 has a color map that is always in the same place when the 128 is in 40-column text mode. This map extends from $D800 to $DBFF in bank 15.

When the C-128 is in its 40-column text mode, memory register $A2C can be used to relocate screen data, character data, or both. The high nibble of $A2C tells the VIC-II where it can find a screen map, and the low nibble points the VIC-II to the segment of memory in which character data is stored.

In order for memory register $A2C to work properly, of course, the C12PRA register ($DD00) must be set to access the video bank in which screen and character data are stored. Figures 4 and 5 show how the VIC-II, C12PRA, and $A2C registers can be used together to generate a text or low-resolution screen display.

## USING MEMORY REGISTER $A2D

When the Commodore 128 is placed in its high-resolution mode, the block of RAM used as screen memory starts by default at memory address $1C00 in memory bank 0. The first 1024 bytes of this memory block—the portion that extends from $1C00 to $1FFF—are used as a color map. The data used to bit-map the screen extends from $2000 to $3FFF.

When a hi-res screen is to be displayed, memory register $A2D can be used to relocate both the RAM block used as a color map and the RAM block that is used as a bit map. The high nibble of $A2D tells the VIC-II chip where it can find the color map that it needs to generate a bit-mapped screen. And the low nibble directs the VIC-II to the starting address of the high-resolution screen map. Since it takes 8000 bytes of memory to produce bit-mapped display, however, only one bit in the $A2D register—bit 3—is used to direct the VIC-II chip to the starting address of a high-resolution screen map.

Memory register $A2D, like memory register $A2C, works hand in hand with the C12PRA register ($DD00).




Reader Service No. 191

For $A2D to work properly, the C12PRA register must be set to access the video bank in which both a color map and a high-resolution screen data are stored. Figures 6 and 7 show how the VIC-II, C12PRA, and $A2D registers can be used together to generate a bit-mapped high-resolution display.

**FIGURE 6**
**High-Resolution Color-Map Addresses**
**(store starting address code in $A2C as follows:)**

| Bits to Set | Hex No. | Starting Addresses<br>Video Bank 0 | Video Bank 1 | Video Bank 2 | Video Bank 3 |
|---|---|---|---|---|---|
| 1111XXXX | $F0 | $3C00 | $7C00 | $BC00 | $FC00 |
| 1110XXXX | $E0 | $3800 | $7800 | $B800 | $F800 |
| 1101XXXX | $D0 | $3400 | $7400 | $B400 | $F400 |
| 1100XXXX | $C0 | $3000 | $7000 | $B000 | $F000 |
| 1011XXXX | $B0 | $2C00 | $6C00 | $AC00 | $EC00 |
| 1010XXXX | $A0 | $2800 | $6800 | $A800 | $E800 |
| 1001XXXX | $90 | $2400 | $6400 | $A400 | $E400 |
| 1000XXXX | $80 | $2000 | $6000 | $A000 | $E000 |
| 0111XXXX | $70 | $1C00 | $5C00 | $9C00 | $DC00 |
| 0110XXXX | $60 | $1800 | $5800 | $9800 | $D800 |
| 0101XXXX | $50 | $1400 | $5400 | $9400 | $D400 |
| 0100XXXX | $40 | $1000 | $5000 | $9000 | $DC00 |
| 0011XXXX | $30 | $0C00 | $4C00 | $8C00 | $CC00 |
| 0010XXXX | $20 | $0800 | $4800 | $8800 | $C800 |
| 0001XXXX | $10 | $0400 | $4400 | $8400 | $C400 |
| 0000XXXX | $00 | $0000 | $4000 | $8000 | $C000 |

**FIGURE 7**
**High-Resolution Screen-Map Addresses**
**(set bit 3 of $A2D as follows:)**

| Setting of Bit 3 | Hex No. | Starting Addresses<br>Video Bank 0 | Video Bank 1 | Video Bank 2 | Video Bank 3 |
|---|---|---|---|---|---|
| XXXX1XXX | $08 | $2000 | $6000 | $A000 | $E000 |
| XXXX0XXX | $00 | $0000 | $4000 | $8000 | $C000 |

In the SPRITE1 program, the block of memory used as a color map starts at $5C00, and the block used as a screen map starts at $6000. It takes only two lines of code–lines 423 and 424–to point the VIC-II chip to the two banks of memory that will be used to color-map and bit-map the program's high-resolution screen. Register $A2D is labeled SVMCSB (for "shadow MVCSB") in SPRITE1, and the two lines that point the VIC-II chip to the program's color map and bit map are reproduced in Figure 8.

**FIGURE 8**
**Setting the SVMCSB Register**

```
LDA #$78
STA SVMCSB
```

## CREATING GIANT CHARACTERS

The SPRITE1 program paves the way for the SPRITE2 program by printing a giant-sized message on the C-128 screen. And it accomplishes this feat without requiring the programmer to create, purchase, or otherwise acquire a special character set; it simply copies the C-128's character set into RAM, and then blows each character up to four times its normal size. And, since each character is stored in RAM in its original size, the giant characters produced by SPRITE1 do not require a giant-sized chunk of memory.

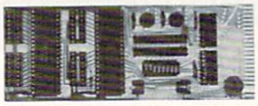
Another noteworthy feature of SPRITE1's character-generating module is its simplicity. To copy the C-128's character set into RAM, the program uses an algorithm much like one presented in this column a few months ago. As each character is called up to be displayed on the screen, each dot is copied into screen memory twice, doubling the character's width. And each scan line in each character is also placed in screen memory twice, doubling the character's height. Result: quadruple-size screen characters, all produced in lines 267 through 317 of the SPRITE1 program.

SPRITE1 was written on a Commodore 64 using a *Merlin 64* assembler. With minor modifications, though, it can be typed, assembled, and run using any C-64 or C-128 assembler. Type it, assemble it, and execute it, and you'll see it display part of a headline-size message on your C-128 screen. And be sure to save the program on a disk; next month, we'll add a sprite that will complete and animate the display. □

*SEE PROGRAM LISTING ON PAGE 122*

*THE ULTIMATE CONTROL INTERFACE*

Compatible with C64, C128 in 64 & 128 modes, and C128 in CP/M mode



Universally applicable dual 6522 Versatile Interface Adapter (VIA) board. Intelligently control almost any device. Perform automated testing. Acquire data for laboratory and instrumentation applications. Provides four 8-bit fully bidirectional I/O ports & eight handshake lines. Four 16-bit timer/counters. Full IRQ interrupt capability. Expandable. Includes extensive documentation and programs on disk. $169 postpaid USA. Each additional board $149.

*SYMBOL MASTER MULTI-PASS SYMBOLIC DISASSEMBLER*

The original and best is now even better with Version 2.0! Disassembles any 6502/6510/undoc/65C02/8502 machine code program into beautiful source. Includes both C64 & C128 native mode versions. Learn to program like the experts! Adapt existing programs to your needs! Outputs source code files to disk fully compatible with your MAE, PAL, CBM, Develop-64, LADS, Merlin or Panther assembler, ready for re-assembly and editing. 100% machine code and extremely fast. 63-page manual. Advanced and sophisticated features far too numerous to detail here. $49.95 postpaid USA.

*PROFESSIONAL UTILITIES & RESOURCES*

- C64 Source Code. Most complete available reconstructed, extensively commented and cross-referenced assembly language source code for Basic and Kernal ROMs, all 16K. In book form, 242 pages. $29.95 postpaid USA.
- PTD-6510 Symbolic Debugger for C64. An extremely powerful tool with capabilities far beyond a machine-language monitor. 100-page manual. $49.95 postpaid USA.
- MAE64 version 5.0. Fully professional 6502/65C02 macro editor/assembler. 80-page manual. $29.95 postpaid USA.

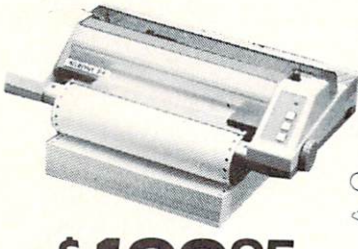
SCHNEDLER SYSTEMS
1501 N. Ivanhoe, Dept. A11, Arlington, VA 22205
Information/Telephone Orders (703) 237-4796. VISA/MasterCard

# COMPUTER CENTERS GOES PRINTER CRAZY!

IN N.Y. STATE CALL TOLL FREE **1-800-548-0009** **1-800-631-1003** OUT OF STATE CALL **1-800-221-2760**

## C.ITOH — NEVER BEFORE AT THESE PRICES

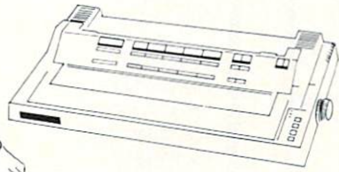
### RITEMAN C+
- COMMODORE READY
- FULL GRAPHICS
- NEAR LETTER QUALITY



**$199.95**

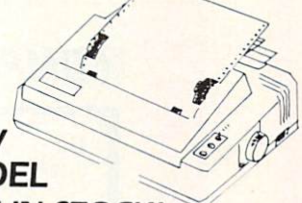


### RITEMAN 11
- 10 INCH CARRIAGE
- 160 C.P.S.
- 8K BUFFER
- NEAR LETTER QUALITY
- FULL GRAPHICS



**$229.95**

## star micronics — NEWEST!



NEW MODEL NOW IN STOCK!

**$179.95**

### LV 1210
- 120 CPS
- DOT MATRIX
- FRICTION & TRACTOR FEED
- NEAR LETTER QUALITY
- CONTINUOUS UNDERLINE

WE ARE AN AUTHORIZED STAR REPAIR CENTER

**CALL FOR PRICES**

### commodore
1571 DISC DRIVE

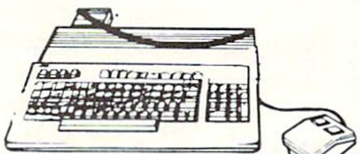
**$239.95**

### ALSO AVAILABLE
### RITEMAN 15
- 15 INCH CARRIAGE
- 160 C.P.S.
- 8K BUFFER
- NEAR LETTER QUALITY
- FULL GRAPHICS

**$329.95**

### commodore
1902 A MONITOR

**CALL FOR PRICE**



### commodore
128 PERSONAL COMPUTER

**$259.95**

### GEOS™
GRAPHIC ENVIRONMENT OPERATING SYSTEM

INCLUDES
- 5 Different Fonts
- deskTop
- geoPaint
- geoWrite
- Desk Accessories

FOR THE COMMODORE 64

**CALL FOR PRICE**

### MEMOREX SPECIAL
WORK STATION

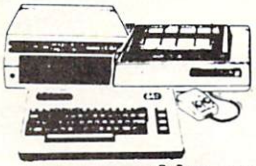
•20 Disks •Disk Case



YOUR COST **$18.95**

### EPYX SPECIAL!
KARATE - NEW **$19.95**

| | |
|---|---|
| Karate | |
| Kronis Rift - Lucas Games | Temple of Asphai |
| Eidolon - Lucas Games | Trilogy |
| Ballblazer - Lucas Games | Jet Combat |
| Rescue Fractalus - Lucas Games | Simulator |
| Fastload | GI Joe |
| Wintergames | Summer Games I or II |
| Hot Wheels | Barbie |
| | Baseball |



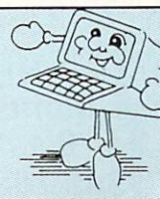
### commodore 64 PACKAGE
INCLUDES:
- Commodore 64 Computer
- Commodore 1541 Disc Drive
- A Color Monitor with Cables

**CALL FOR PRICE**

### Paperback Writer 128
Paperback Filer 128
Paperback Planner 128
YOUR CHOICE **$29.95**
for the Commodore 128

IN N.Y. STATE CALL TOLL FREE
**1-800-548-0009**
**1-800-631-1003**
OUT OF STATE CALL
**1-800-221-2760**

**COMPUTER CENTERS OF AMERICA**
81 TERMINAL DRIVE
PLAINVIEW, NY 11803



*IN CONTINENTAL USA ONLY APO PLUS FPO EXTRA

Check, Money Order, MC or VISA accepted. No additional charge for MasterCard and Visa. Call for shipping and handling information / NYS residents add applicable sales tax / Prices and availability are subject to change without notice / All factory fresh merchandise with manufacturer's warranty. Dealers Welcome. Call for recent price reductions and new rebate information. Plus shipping and handling. No returns without return authorization number.


Reader Service No. 181

# WHITE HOUSE COMPUTER

P.O. Box 4025 Williamsport, PA 17701

**"Where Prices are Born, Not Raised."**

Disk Notchers $3.99

Mini-Vac $13.95

## COMPUTERS

| | |
|---|---|
| 64C | CALL |
| C-128 | $275 |

## MODEMS

| | |
|---|---|
| Mitey Mo | $56 |
| C-1670 | 159 |
| Avatex 1200 | 95 |
| Avetex 1200 HC 100% Hayes | 143 |
| Team Modem 100% Hayes | 199 |
| Messenger | 41 |
| Compuserve | 21 |

## DISK DRIVES

| | |
|---|---|
| 1541C | CALL |
| C1571 | $239 |
| Enhancer 2000 | 179 |
| Indus GT | 189 |
| Blue Chip | 155 |

## INTERFACES

| | |
|---|---|
| Super G | $52 |
| PPI | 39 |
| MW350 4K | 48 |
| MN350 10K | 64 |
| Xetec Super 8K | 64 |
| Micro Stuffer | 69 |

## PAPER

WHITE 20 LB LAZOR EDGE

| | |
|---|---|
| 2500 Sheets | $26 |
| 1000 Sheets | 16 |
| 500 Sheets | 11 |

ASSORTED PASTELS LAZOR EDGE

| | |
|---|---|
| 2500 Sheets | $44 |
| 1000 Sheets | 26 |
| 500 Sheets | 16 |
| 1000 Mailing Labels | 9 |

## DISKETTES

3½

FUJI

| | |
|---|---|
| SS/DD | $17 |
| DS/DD | 24 |

NASHUA

| | |
|---|---|
| SS/DD | $21 |
| DS/DD | 26 |

5¼

FUJI

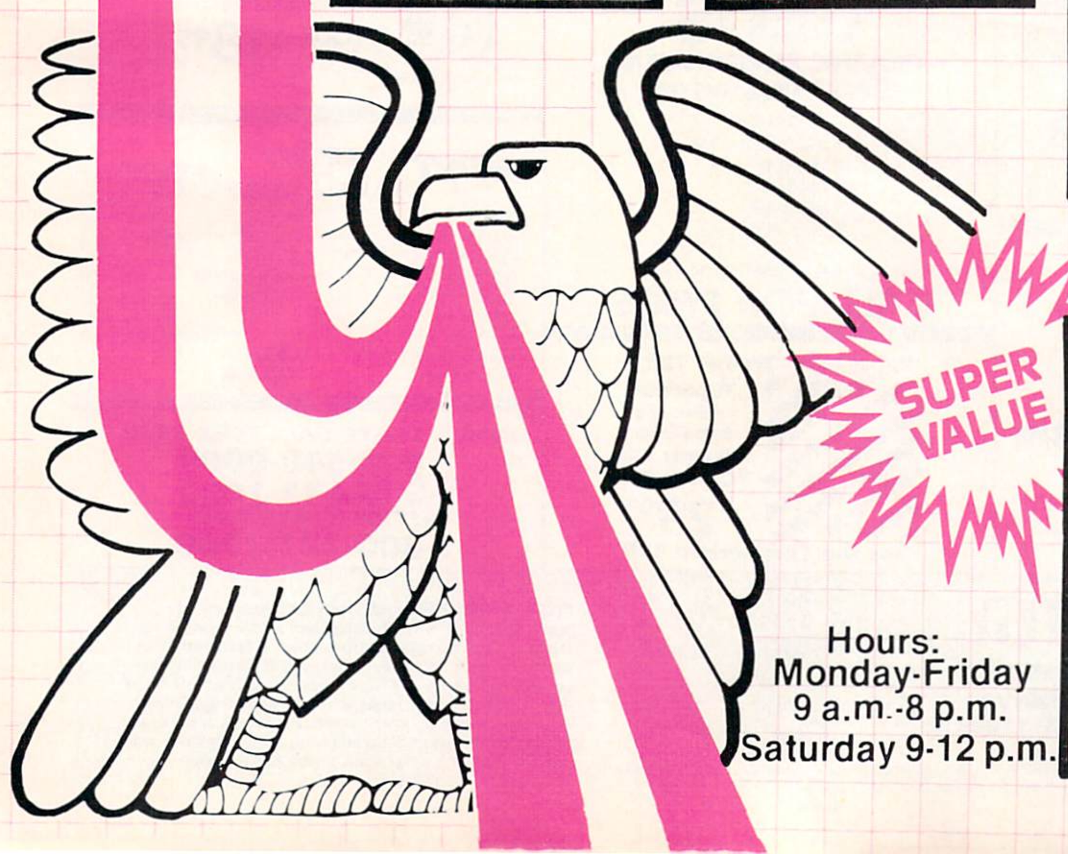
| | |
|---|---|
| SS/DD | $11 |
| DS/DD | 14 |

ELEPHANT

| | |
|---|---|
| SS/DD | $12 |
| DS/DD | 14 |

Disk Banks

| | |
|---|---|
| Allsop | CALL |
| Innovative Concepts | CALL |







*5¼" MD1D AND MD2D TEN-PACKS

**FREE AUDIO CASSETTE**

ON EACH BOX OF FUJI FILM FLOPPY DISKS

Hours:
Monday-Friday
9 a.m.-8 p.m.
Saturday 9-12 p.m.

## MONITORS

### AMDEK

| | |
|---|---|
| 300G | $117 |
| 300A | 127 |
| 310A | 145 |
| Color 600 | 395 |
| Color 700 | 494 |
| Color 710 | 568 |

### ATARI

| | |
|---|---|
| SM124 | $169 |
| SC1224 | 325 |

### NEC

| | |
|---|---|
| 1201 | $139 |
| 1205 | 89 |
| 1260 | 79 |

### TAXAN

| | |
|---|---|
| 220 Color/Green/14'' | $179 |

### THOMSON

| | |
|---|---|
| CM365 RGB/Color/Green With Cables | $269 |

### TEKNIKA

| | |
|---|---|
| MJ-10 | $159 |
| MJ-22 | 254 |

### SAKATA

| | |
|---|---|
| SC-100 | $140 |

### ZENITH

| | |
|---|---|
| ZVM 1220 | $95 |
| ZVM 1230 | 95 |

### BLUE CHIP

| | |
|---|---|
| Green | $89.00 |
| Amber | 93.00 |
| Color/RGB | 279.00 |

### MAGNAVOX

| | |
|---|---|
| 8CM515 14'' screen/green screen/RGB/640 dots | $365.95 |
| 8CM505 14'' screen/green screen/RGB/390 dots | 195.95 |
| 7B613 green screen/1000 lines/Built in tilt stand | 84.95 |
| 7BM623 amber screen/1000 lines/Built in tilt stand | 84.95 |

## PRINTERS

PRINTER RIBBONS AND DUST COVERS AVAILABLE

### OKIDATA

| | |
|---|---|
| Okimate 10 | $171 |
| Okimate 20 | 211 |
| 182 | 214 |
| 192 | 348 |
| U-93 | 389 |

### CITIZEN™

| | |
|---|---|
| MSP-10 | $267 |
| MSP-15 | 367 |
| MSP-20 | 354 |
| MSP-25 | 527 |
| 120D | 194 |



### LEGEND

| | |
|---|---|
| 808 | $154 |
| 1080 | 205 |
| 1380 | 259 |
| 1385 | 295 |

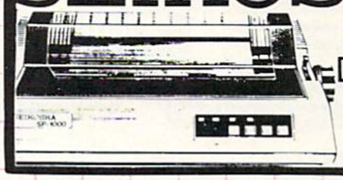
### star micronics·inc

| | |
|---|---|
| NX-10 | CALL |
| Gemini II | CALL |
| SG-15 | $366 |
| SD-15 | 440 |
| SR-10 | 469 |
| SR-15 | 580 |
| SB-10 | 588 |
| SG-10C | 230 |
| Powertype | 295 |

### Panasonic

| | |
|---|---|
| 1080 | $209 |
| 1091 | 231 |
| 1592 | 459 |
| 1595 | CALL |
| 3131 | 259 |
| 3151 | 408 |

### SEIKOSHA



THE SP-1000 SERIES
DIRECT CONNECT
COMMODORE
$189.00

## SOFTWARE

### BATTERIES INCLUDED

| | |
|---|---|
| Consultant | $37 |
| Homepark | 29 |
| Paperclip | 36 |
| Paperclip/Spell | 49 |
| Spellpack | 30 |
| ISGUR Portfolio | 151 |

### MICROPROSE

| | |
|---|---|
| Conflict in Vietnam | $24 |
| F-15 Strike Eagle | 21 |
| Kennedy Approach | 21 |
| Silent Service | 21 |

### SPRINGBOARD

| | |
|---|---|
| Clip Art #1 | $19 |
| Clip Art #2 | 25 |
| Newsroom | 31 |

### SSI

| | |
|---|---|
| Battle of Antietam | $31 |
| Computer Quaterback | 25 |
| Fortress | 10 |
| Nam | 25 |
| 84 Quarterback Data | 14 |

### SUBLOGIC

| | |
|---|---|
| Flight Simulator | $32 |
| Jet | 27 |
| Night Mission Pinball | 21 |
| Scenery Disks | 14 |

### ELECTRONIC ARTS

| | |
|---|---|
| Financial Cookbook | $26 |
| Music Construct. Set | 16 |
| One-on-One | 22 |
| 7 Cities of Golf | 22 |
| Ultima III | 34 |
| Ultima IV | 40 |

### EPYX

| | |
|---|---|
| Eidolon | $25 |
| Fast Load | 25 |
| Rescue at Fractalus | 26 |
| Scrabble | 26 |
| Summer Games | 26 |
| Temple of Apshai | 20 |
| Winter Games | 26 |

### FIREBIRD

| | |
|---|---|
| Elite | $19 |
| Advanced Music Sys | 47 |
| Consise Music Sys | 26 |

### BRODERBUND

| | |
|---|---|
| Bank Street Writer | $31 |
| Bank Street Speller | 31 |
| Blue Max 2001 | 20 |
| Karateka | 19 |
| Lode Runner | 23 |
| Music Shop | 29 |
| Print Shop | 26 |
| Print Shop Companion | 22 |
| Libraries | 16 |

### TIMEWORKS

| | |
|---|---|
| Data Manager 128 | $43 |
| Partner 128 | 37 |
| Swiftcalc 128 | 43 |
| Sylvia Porter 128 | 43 |
| Word Writer 128 | 43 |
| Account Payable 64 | 37 |
| Accounts Receivable 64 | 37 |
| General Ledger 64 | 37 |
| Inventory Management 64 | 37 |
| Partner 64 | 31 |
| Payroll Management 64 | 37 |
| Sideways 64 | 21 |
| Word Writer/Spell 64 | 31 |

### VALUEWARE (TIMEWORKS)

HOME MANAGER (3 in 1)
• *Word Processer* • *Data Magic Calculator* ........ $7.00

KITCHEN MANAGER (2 in 1)
• *Electronic Cookbook* • *Diet Doctor* ........ $7.00

HOME BANKER (5 in 1)
• *Checkbook Organizer*
• *Loan Amortizer*
• *Depreciation Calculator*
• *Savings Organizer*
• *Mortgage Manager* ........ $7.00

THE ARTIST (3 in 1)
• *Computer Artist* • *Frame It* • *Sprite Builder* ........ $7.00

Put's JOYSTICKS $6.95 1 yr. warranty



**ORDER TOLL FREE 1-800-351-3442**

VISA 4%, MASTER CARD 4%, AMERICAN EXPRESS 5%

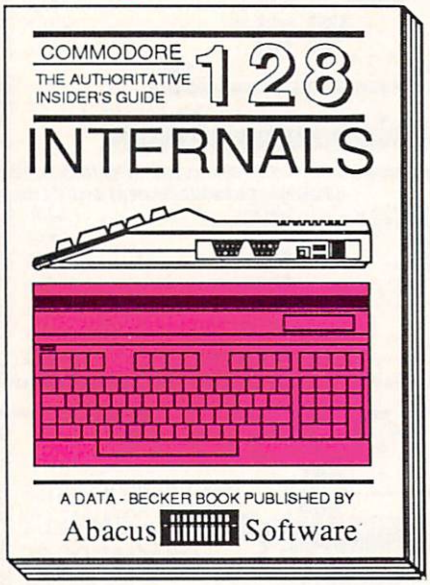
**CUSTOMER SERVICE AND PA RESIDENTS CALL 1-717-322-7700**

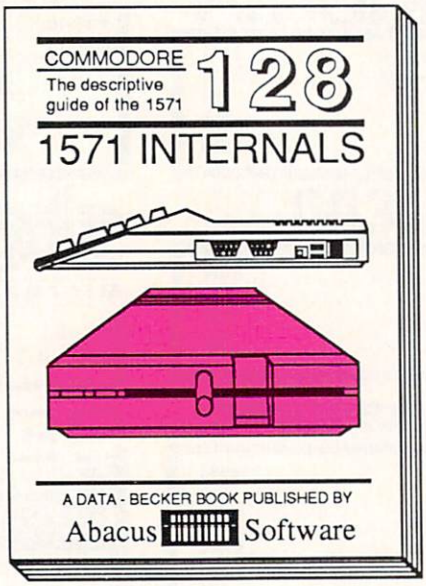
Ordering and Terms

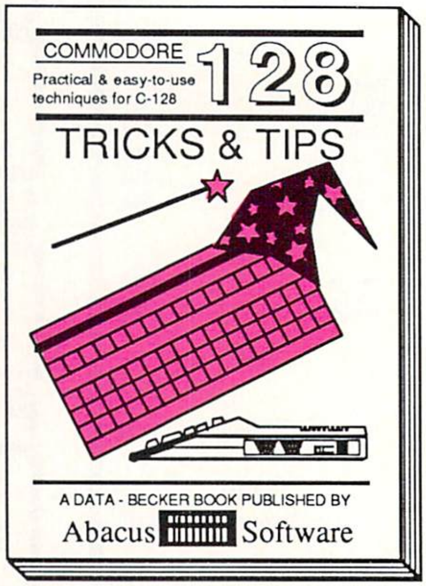
Place orders Mon-Fri 9am-8pm, Sat. 9-12 pm. Customer service calls taken Mon.-Fri. 10am-4pm. No deposit on C.O.D. orders. Free freight on all prepaid cash orders over $300 in the continental U.S.A. APO andFPO orders add $5 per hundred. Priority mail add $10 per hundred. All foreign orders add 8% for shipping. UPS shipping add $4 per hundred Eas Coast, $5 per hundred West Coast. PA residents add 6% sales tax. Free shipping for PA residents. Orders by company and personal checks held 3 weeks. Defective products require prior return authorization. Defective products will be replaced or repaired according to warranty. **No used or reconditioned products sold.** Prices and availability are subject to change without notice. No cash refunds.

Reader Service No. 186

# One good book... deserves another... and another...



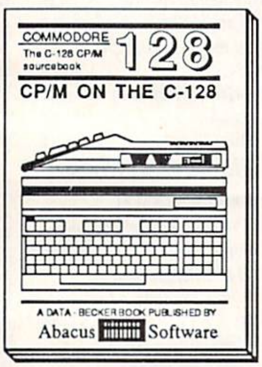



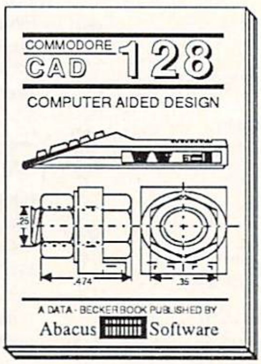

**C-128 INTERNALS**
Detailed guide presents the 128's operating system, explains graphic chips, Memory Management Unit, 80 column graphics and commented ROM listings. **500pp** $19.95

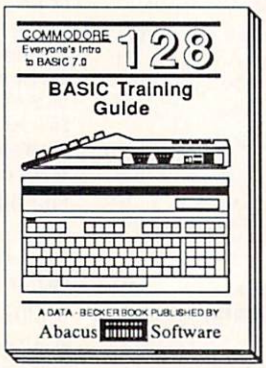
**1571 INTERNALS**
Insiders' guide for novice & advanced users. Covers sequential & relative files, & direct access commands. Describes DOS routines. Commented listings. **450pp** $19.95

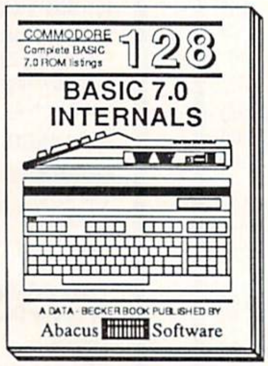
**C-128 TRICKS & TIPS**
Filled with info for everyone. Covers 80 column hi-res graphics, windowing, memory layout, Kernal routines, sprites, software protection, autostarting. **300pp** $19.95

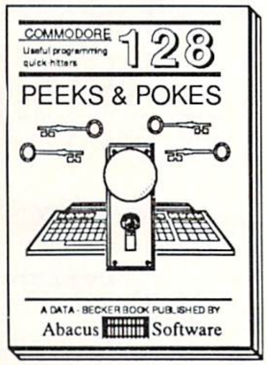
# And so on... and on... and on... and on... and on...




**C-128 CP/M USER'S GUIDE**
Essential guide for everyone interested in CP/M on the 128. Simple explanation of the operating system, memory usage, CP/M utility programs, submit files & more. $19.95

**C-128 Computer Aided Design**
Learn fundamentals of CAD while developing your own system. Design objects on your screen to dump to a printer. Includes listings for '64 with Simon's Basic. **300pp** $19.95

**C-128 BASIC Training Guide**
Introduction to programing; problem analysis; thorough description of all BASIC commands with hundreds of examples; monitor commands; utilities; much more. $16.95

**C-128 BASIC 7.0 INTERNALS**
Get all the inside information on BASIC 7.0. This exhaustive handbook is complete with fully commented BASIC 7.0 ROM listings, more. $19.95

**C-128 PEEKS & POKES**
Presents dozens of programming quick-hitters. Easy and useful techniques on the operating system, stacks, zero-page, pointers, the BASIC interpreter and more. $16.95

Commodore 64® and Commodore 128™ are trademarks of Commodore Electronics Ltd.

# Abacus

**P.O. Box 7219 Dept. HB Grand Rapids, MI 49510 - Telex 709-101 - Phone (616) 241-5510**

If you want to start up (or add on to) the most comprehensive and coordinated series of **Commodore 128 reference books** available anywhere, check your local bookstore or software dealer. Or order directly using your MC, Visa or Amex credit card. Add $4.00 per order for shipping and handling. Foreign orders add $10.00 per book. Call now or write for your free catalog–also contains information on our C-64 books and software. Dealers inquires welcome—over 1400 dealers nationwide.

Reader Service No. 189




# TELEPORTER

## For the C-64

### By Cleveland M. Blakemore

You walked up the boarding ramp with the ad clutched in your hand, crisp in your new cadet pressure suit. As you passed through the ship entrance, a gibbering lunatic was escorted out of the ship by two spaceport MPs. He glanced at you wildly from his straitjacket, restrained by the two large officers on either side.

"Fry them all. It's the only way to be sure you'll keep the freeloaders off!" he said, giggling.

Once inside the ship, the wrinkled, prunefaced captain, Finch Legree, explained your responsibilities while he eyeballed your uniform for starch creases.

"Your job is simple, young man. Watch the instruments. Monitor the arrivals on the teleporter ramp. If you think we're being boarded by some hitchhiker, charge the teleporter grid and fry him into charcoal!"

You understood the captain's problem, of course. Aliens were notorious for sneaking on starships on the teleport beams just to avoid the price of a flight ticket. They even went to the trouble of sending a fake transmission announcing their arrival, complete with bioscan readings and images. But a good teleport specialist, one like you, could spot the inconsistencies between received and apparent readings and ferret out the imposters.

---

In the game of *Teleporter*, you stand before a 3-D picture of a control panel and a teleporter pedestal. Personnel from all walks of life materialize slowly in front of you. Before they arrive, you will get a prior transmission that will display a bioscan reading (B), a body temperature reading (T), and a waveform for that alien's correct brainwaves (R). You will also see a transmitted image of the alien that is supposed to arrive on your IMAGE screen. If at any time during his materialization, his bioscan or temperature reading fluctuates more than (.5) from normal, or his received waveform (R) seems to fluctuate from his normal one (W), press the space bar or joystick button on Port 1. The grid will electrify and the alien will be disintegrated.

Legree is also watching on his monitor while the alien beams onboard. If he seems to frown more than usual, it could indicate something is fishy. You have to get used to his personality to be able to judge.

You will monitor 20 arrivals, after which you will receive a rating from Captain Legree. If you have made more than six mistakes, Captain Legree will fire you from your post.

The first six or seven levels are pretty easy. Usually the alien will be the wrong type, or will have different colors on his uniform. After that it gets a bit more difficult. The game is a good test of intuition–the feeling of knowing something without understanding how you know it. Watch the readings and waveforms for too much variation. Keep an eye on Legree–if he frowns a lot, that's a good tip the alien is a fake.

Later on, the game gets very tricky. The ship's computer malfunctions. Screens flicker and shut off. Transmissions are garbled. Captain Legree goes to lunch. The image on your monitor may not be the right one for the alien that is boarding. The ship itself passes through meteor belts and radiation storms, causing the teleporter room to shake and buckle, making it harder to watch the screens. Captain Legree is a real miser, and he may even shut off some of your equipment himself to save energy.

At the end of 20 arrivals, you may be glad to resign your post. But I hope you will like the game–if you attain a perfect score, Legree will knight you a "Regular Ricky Rocket!"

The game is written entirely in BASIC, with a little ML to copy character data down. It uses several neat graphic tricks with sprites and sprite priorities to create the "Beam-on" effect, and has some gimmicks in it to make the ship shake. My favorite is switching to an undefined character set to create the effect of "electrifying" the teleporter grid. The undefined set consists of totally random bytes in character memory, making the screen "sizzle."

You should be able to type the game in one short sitting, and I hope you'll find it a very interesting piece both in programming technique and playability. ☐

*SEE PROGRAM LISTING ON PAGE 130*

# DELUXE LIST

## C-64 Program Prettification

### By Mark Bersalona

BASIC programmers usually put several commands on each program line. This practice saves a few bytes of memory per program line and lets the program run slightly faster. However, it also makes the program listing difficult to read. How can we have the compactness of multiple statements on each line with the legibility of lines with single statements? *Deluxe List* solves this problem.

*Deluxe List* is a machine language routine stored as a BASIC loader. When the loader is run, the ML is wedged into the LIST routine. When a program is listed, *Deluxe List* looks for colons that are not within strings. All strings are assumed to begin and end with quotation marks, i.e., strings at the end of program lines must have close quotes. If it finds such colons, *Deluxe List* jumps to the next line, prints two spaces, and prints the next statement. If there are several statements in a line, *Deluxe List* prints each on a separate line.

As a bonus, the SHIFT key will freeze a listing. Unlike many other LIST-freezing utilities, the SHIFT key only pauses a LIST. It will not interfere with a running program.

#### HOW *DELUXE LIST* WORKS

The BASIC in the 64 has six main vectors starting at $300. The IQPLOP vector, ($306), is used by LIST to untokenize keywords. By changing the vector ($306) to point to *Deluxe List* or any other new routine, we can easily improve LIST. The end of *Deluxe List* jumps to $A71A, the address to which ($306) normally points.

#### HOW TO USE *DELUXE LIST*

The first listing on page 142, DELUXE LIST49152, puts *Deluxe List* in memory starting at location 49152 and activates it. When *Deluxe List* is activated it is important not to edit program lines with the screen editor. To see why, type in a program line with at least two commands (10 PRINT:PRINT for example). LIST the line with *Deluxe List* activated, edit the line with the screen editor, and hit RETURN. LIST the line again. The new program line is probably not what you expected. You can edit lines with single statements, or you can retype entire lines, but it is easier and safer to disable *Deluxe List.* SYS49152 will toggle *Deluxe List*, activating or disabling it.

Many machine language utilities also load into memory starting at 49152. The second listing on page 142, DELUXE LIST828, puts *Deluxe List* in the cassette buffer starting at location 828. SYS828 will toggle *Deluxe List* at this location. Note that tape use will overwrite *Deluxe List.*

*Deluxe List* is ideal for printing listings on paper. Be sure *Deluxe List* is activated before listing to a printer. ☐

*SEE PROGRAM LISTINGS ON PAGE 142*


THE LOWEST PRICES — THE BEST SERVICE — **ELECTRONIC ONE*** — PHONE LINES OPEN 10-6 E.S.T. M-F

**CALL (614) 864-9994 • P.O. Box 13428 • COLUMBUS, OHIO 43213**

commodore

| HARDWARE | |
|---|---|
| C128 COMPUTER | 259.99 |
| C64 COMPUTER | 139.99 |
| 64C COMPUTER | 179.99 |
| 1541 DISK DRIVE | 179.99 |
| 1571 DISK DRIVE | 239.99 |
| 1702 MONITOR | 179.99 |
| 1902A RGB MONITOR | 279.99 |
| MPS 1000 PRINTER | 239.99 |
| 1350 MOUSE | 34.99 |
| 1670 1200 BAND MODEM | 149.99 |
| **PRINTERS** | |
| STAR NX10 | 239.99 |
| EPSON LX80 | 229.99 |
| PANASONIC 1080 | 199.99 |
| PANASONIC 1091 | 229.99 |
| SEIKOSHA SP1000UC | 179.99 |
| COMM 1525 | 79.99 |
| COMM 801 | 89.99 |
| **MISC. HARDWARE/MONITORS** | |
| TYMAC INTERFACE | 44.99 |
| PPI INTERFACE | 29.99 |
| XETEC JR. | 39.99 |
| XETEC SR. | 56.99 |
| TOTAL COMM. MODEM | 29.99 |
| 14" COLOR THOMPSON MONITOR | 129.99 |
| 13" GOLD STAR COLOR | 129.99 |
| 14" TEKNIKA COLOR | 149.99 |

| SOFTWARE | |
|---|---|
| KARATEKA | 19.99 |
| PRINT SHOP | 27.99 |
| PRINT SHOP COM. | 24.99 |
| PRINT SHOP LIB. | 14.99 |
| F-15 | 22.99 |
| SILENT SERVICE | 22.99 |
| LEADER BOARD | 24.99 |
| ARCHON | 12.99 |
| ONE ON ONE | 12.99 |
| FOOTBALL | 12.99 |
| MAIL MONSTERS | 12.99 |
| MULE | 12.99 |
| MUSIC SET | 12.99 |
| PINBALL CONS. | 12.99 |
| SEVEN CITIES | 12.99 |
| BARDS TALE | 24.99 |
| SKY FOX | 24.99 |
| SUBLOGIC FOOTBALL | 26.99 |
| SUBLOGIC BASEBALL | 26.99 |
| FAST LOAD | 24.99 |
| MACH 5 | 22.99 |
| MACH 128 | 29.99 |
| WORD WRITER 128 | 39.99 |
| SUPER PASCAL | 49.99 |
| JANE | 34.99 |
| NEWSROOM | 29.99 |
| CONSULTANT | 39.99 |

*CLOSEOUT SOFTWARE*
*ALL QUALITIES ARE LIMITED*

| | |
|---|---|
| ALF COLOR CAVES | 3.99 |
| DANCE FANTASY | 3.99 |
| WEBSTER WORD GAME | 3.99 |
| LOGIC LEVELS | 3.99 |
| SEA HORSE | 6.99 |
| HEY DIDDLE | 3.99 |
| TRAINS | 3.99 |
| UP FOR GRABS | 3.99 |
| RHYMES/RIDDLES | 3.99 |
| TURTLE TOYLAND | 2.99 |
| AZTER | 3.99 |
| DUCKS AHOY | 3.99 |
| ESPIAL | 2.99 |
| FRACTION FEVER | 3.99 |
| JUKE BOX | 3.99 |
| STORY MACHINE | 3.99 |
| COSMIC LIFE | 3.99 |
| DELTA DRAW | 3.99 |
| FACE MAKER | 3.99 |
| THE FACTORY | 1.99 |
| SPARE CHANGE | 3.99 |
| JUNO FIRST | 3.99 |
| MR. ROBOT | 4.99 |
| SNAKE MAN | 3.99 |
| GENESIS | 3.99 |
| CHOP LIFTER | 4.99 |
| PILOT | 4.99 |
| GORTEC | 1.99 |

| | |
|---|---|
| ON FIELD FOOTBALL | 9.99 |
| GYRUSS | 3.99 |
| GHOST BUSTERS | 7.99 |
| DIG DUG | 4.99 |
| JAW BREAKER | 4.99 |
| DECATHLON | 7.99 |
| WIZARD PRINCESS | 7.99 |
| POOYAN | 4.99 |
| SAMMY LIGHTFOOT | 4.99 |
| CODE WRITER | 7.99 |
| PIT STOP | 9.99 |
| DAVIDS PINBALL | 4.99 |
| GATEWAY APSHAI | 9.99 |
| SPACE RESCUE | 2.99 |
| CURSE OF RAI | 1.99 |
| ROBOTS DAWN | 6.99 |
| FISHER PRICE MUSIC | 9.99 |
| BEIGE ROOT | 9.99 |
| TREASURE ISLAND | 9.99 |
| ALICE WONDERLAND | 9.99 |
| DALLAS QUEST | 9.99 |

***HURRY WHEN THESE CLOSEOUTS ARE GONE THERE IS NO MORE. MOST ARE CART OR DISK EXCEPT GORTEC.***

**HOW TO ORDER:** CASHIER CHECK, MONEY ORDER, MASTERCARD* OR VISA* (ADD 4% FOR CHARGE CARDS) . . . NO PERSONAL CHECKS . . . NO C.O.D.'S . . . SHIPPED U.P.S. . . . ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
**SHIPPING:** ADD $3.00 ON ALL ORDERS UNDER $100.00 . . . ADD $5.00 ON ALL ORDERS OVER $100.00. ACTUAL FREIGHT CHARGED ON MULTIPLE ORDERS.
**INTERNATIONAL:** ACTUAL FREIGHT CHARGED ON ALL ORDERS OUTSIDE THE CONTINENTAL UNITED STATES INCLUDING A.P.O.
**POLICIES:** NO RETURNS WITHOUT A RETURN AUTHORIZATION . . . NO RETURNS UNLESS DEFECTIVE. ALL DEFECTIVES WILL BE EXCHANGED . . . NO EXCEPTIONS. PLEASE SPECIFY . . .

**CALL OR WRITE FOR FREE CATALOG**

**CALL ELECTRONIC ONE (614) 864-9994 P.O. BOX 13428 COLUMBUS, OHIO 43213**




Reader Service No. 188

# Take Hi Tech Home For The Holidays!

All you need is JingleDisk, your PC and printer, a little Holiday PrinterPaper and you'll create unique holiday cards even Santa won't forget!

After the cards are out and the gifts are given, just boot up your computer, turn up the sound and let JingleDisk entertain with Yuletide carols and vivid animations.







Available for Apple, Atari, Commodore and IBM formats.




## JingleDisk™

$9.95 Suggested Retail Price

Holiday Card Maker & Greeting Disk

## Holiday PrinterPaper™

$9.95 Suggested Retail Price

Three Colorful Printer Paper Designs & Four Sticker Designs!

Hi Tech Expressions, Inc., 2699 South Bayshore Drive, Suite 1000A, Coconut Grove, Florida 33133. 1-800-848-9273

HI TECH EXPRESSIONS™

Reader Service No. 182




***Disk drive alignment problems? Drive out of alignment again? Tired of waiting two weeks or more to get your drive fixed??***

***WE HAVE THE ANSWER ! !***

With the 1541 DISK DRIVE ALIGNMENT PROGRAM you can align the drive yourself in an hour or so. Not only that, you can do it at home AND no special equipment is required. Anyone with average mechanical skills can do it! !

*INSTRUCTIONS INCLUDED FOR "THE FIX"—It may just keep your drive from ever going out of alignment again.*

**WHY BE AT THE MERCY OF REPAIR SHOPS?**

*Align the drive yourself with CSM's 1541 DISK DRIVE ALIGNMENT PROGRAM.*

***What the review in Compute!s Gazette said about...***

**THE 1541 DISK DRIVE ALIGNMENT PROGRAM**

*". . . with* 1541 Disk Drive Alignment *from CSM Software, you can fix it* [the disk drive] *yourself in an hour or so and the program will pay for itself the first time you use it . . . No technical expertise is required to accomplish the alignment procedures, and the manual accompanying the program thoroughly describes the procedures."*

*"1541 Disk Drive Alignment. . .a wise addition to your home disk library."*

***From COMPUTE!'s Gazette, Oct., 1984***

**1541 DISK DRIVE ALIGNMENT PROGRAM VERSION 2.0**

***$44.95 plus shipping***

***OTHER QUALITY CSM PRODUCTS***

**PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME II**
***$34.95 plus shipping***

**CSM PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME I**
***$29.95 plus shipping***

**DELUXE NUMERIC KEYPAD**
***$64.95 plus shipping***

**CARTRIDGE BACKER**
***$54.95 plus shipping***

**PROGRAM PROTECTION NEWSLETTER**
***$35.00 post paid in U.S. & Canada***
***$45.00 First Class post paid Foreign***

**VISA AND MASTERCARD ACCEPTED**
**DEALER INQUIRIES INVITED**

*Shipping $3.50 per item in U.S.; foreign orders extra*

*Available through your local software dealer or call:*

*CSM SOFTWARE, INC.*

*POST OFFICE BOX 563, CROWN POINT IN. 46307, PHONE (219) 663-4335*

C= *is a registered trademark of Commodore Business Machines, Inc.*

# 128 RAM CHECK

## By Buck Childress

I'll bet you're having a blast with your C-128. What an incredible amount of memory for those Paul Bunyan sized programs! Because it never seems to get full, chances are you'll never use all that RAM. If you're looking for something that will finally exercise those dormant bytes and at the same time make sure they're in working order, give *128 RAM Check* a whirl.

*128 RAM Check* will test the BASIC RAM in banks zero and one, which stretch from 7168-65279 and 1024-65279 respectively. These two memory banks comprise the RAM that gives you 122365 BASIC bytes free.

It also tests four additional areas of RAM in bank zero. They include the buffer for the cassette and disk autoboot (2816-3071), the RS232 input and output buffers (3072-3583), the sprite definition area (3584-4095), and the free RAM area (4864-7167). In addition to being used for sprite data and input/output, many machine language programs and subroutines reside in these areas. In case you're wondering, *128 RAM Check* initially loads into free RAM. After checking the sprite definition area, it relocates itself there in order to check the free area.

*128 RAM Check* works by attempting to store all values from 0 through 255 in each memory location. If successful, it moves to the next location. The area of RAM under scrutiny is displayed and a counter keeps you abreast of the current byte being tested. If all bytes in an area check out fine, you'll see "OK". Should a bad byte be encountered, "ERROR" is printed, along with the location of the byte. *128 RAM Check* then moves to the next area of RAM. When the various RAM areas in both banks have been checked, the test is over.

After saving a copy of *128 RAM Check*, run it. The loader will POKE the data into memory and check for errors. Now type SYS 4864 and press RETURN to check your RAM. Because the loader is erased during the test, be certain you have a good copy saved.

While *128 RAM Check* is running, you'll see a moving object at the top of your screen. This is a video display of the values being stored in each memory location. It appears to be moving because of the great speed of machine language.

*128 RAM Check* takes approximately 25 minutes to check bank zero and 60 minutes to check bank 1. (The bank 1 check requires extra manipulation, making it slower than the bank 0 check.) Because there are more than 125,900 locations to test, *128 RAM Check* must perform in excess of 32,200,000 PEEKs, POKEs, comparisons, and resulting subroutines in order to complete its task. If you don't want to watch it in action, you can let it zip along while you eat dinner or watch TV. Should you want to stop *128 RAM Check* before it's finished, RUN STOP/RESTORE will do the job.

When the test is complete, press the reset button, or turn the computer off then back on to reset it.

The 128 is a fabulous machine with a tremendous amount of RAM. Won't it be nice to know it's all working? ☐

*SEE PROGRAM LISTING ON PAGE 136*


# GUARANTEED SOFTWARE

NOW SHIPPING

NOW SHIPPING

**VIZASTAR for the C128**

Vizastar, the integrated spreadsheet, database and graphics program that has the Commodore 64 world raving, is now available for the C128. It boasts 80 columns, and has over 40K of free memory in the spreadsheet. Those who already own Vizastar 64 will be pleased to know that your existing files can be read by Vizastar 128. Also, you can upgrade to the 128 version. Call us for details and pricing.

"The only other comparable product would be Lotus 1-2-3 for the IBM PC; nothing in the C64 world comes even close to the features of Vizastar."
AHOY July 85

"I found Vizastar would do anything Lotus 1-2-3 could, and then some. It's my Commodore choice to become the standard against which the others will be judged."
INFO 64 Magazine, Issue #7

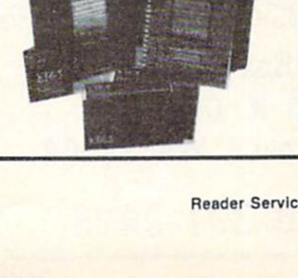
"Vizastar is an exceptional package that rivals the features of programs such as Lotus 1-2-3 and offers C64 owners the kind of integrated software previously only available for higher-priced systems."
RUN Magazine, June 1985

"I scrutinized, tested and experimented with Vizastar extensively, but could find no weaknesses whatsoever. It is the most comprehensive, most flexible, most powerful and easiest to use integrated software package I've worked with."
Commodore Microcomputer, Sept/Oct 1985

"I use an IBM PC at work with Lotus 123. I feel Vizastar is just as good and in someways better than 1-2-3."
Steven Roberson, NC End User

"I have used Multiplan and Superbase; both are good pieces of software, but are inadequate when compared to Vizastar."
Jim Mathews, WA End User

"So good, I bought a second C64 and Vizastar for my office. A wild bargain! You've saved me from having to buy IBM and Lotus."
Philip Ressler, MA End User



**VIZAWRITE CLASSIC for C128**

This is the new word processor from Vizastar's author, Kelvin Lacy and is the successor to Omniwriter, which he also wrote. All the features of Omniwriter are there, plus many significant enhancements, like auto pagination, on-line help, pull-down menus, full-function calculator and more. Up to 8 "newspaper-style" variable-width columns can help with newsletters.

Three different proportionally-spaced "near letter quality" fonts are also built-in for use with Commodore or Epson compatible printers. You can merge almost any other word processor file directly into Vizawrite, including Paper Clip and Omniwriter. Naturally, it is also compatible with Vizastar. At all times, what you see on the screen is exactly the way it will be printed out. Vizawrite can do mail-merges and has an integrated 30,000 word spelling checker that you can expand yourself.

**PROGRAM SPECIFICATIONS**

Both Vizawrite and Vizastar are written in 100% machine language and run in the 128's FAST mode, making it lightning fast. They require a C128 with 80 column color or monochrome monitor. Both come with a cartridge, a diskette, and a reference manual. Vizastar also includes a 50 page tutorial book. Both work with 1541 or 1571 disk drives.

**RISK-FREE OFFER**

Vizastar 128 is priced at **$119.97.** Vizawrite's price is **$89.97.** Vizastar 64 XL8 is now available for **$119.97.** We are so positive you will be satisfied with our programs that we offer a 15-day money-back guarantee. Try it Risk-Free. Call us today or send a check or money order. VISA/MC accepted.

Offer valid only when bought through Solid State Software, or participating dealers.

Calif. residents add 6.5% Sales Tax.
Add P&H: UPS-$4; COD/Canada-$7.

SOLID STATE SOFTWARE

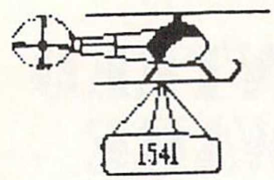
1125 E. Hillsdale Blvd., Suite 104
Foster City, CA 94404-1609
**(415) 341-5606**

• Dealer Inquiries Welcome •

Trademarks: Lotus 1-2-3/Lotus Development; Commodore 64/Commodore Electronics Ltd; Multiplan/Microsoft

Reader Service No. 160

# 1541 M.A.S.H.




Now you can service your own disk drive with the popular program 1541 MASH. You can check and adjust the head alignment; Check and adjust the RPM's. You can also use MASH to clean your drive and check disks for errors. Complete instructions guide you step by step as you rate your drive's performance and make the necessary adjustments. All you need is a screwdriver and about an hour of your time. No knowledge of electronics is necessary. This is the easiest program of its type to use.

*Only $19.95*

**Service Your Disk Drive!**

## Custom Drives

You can customize your 1541 drive giving you added convenience. This booklet will show you how to move the power switch to the front of the drive; install a write protect switch (allowing you to write on the back of a disk without punching holes or removing any tapes); Install a device number switch (a must if you have two drives.) Easy step by step instructions include complete diagrams making the procedure a snap. Complete kit includes switches, wires, connectors.

Booklet - *Only $4.95*
Complete Kit - *$24.95*

## Reset Switch

A Permanent, Case Mounted reset switch that you can easily install by following our step by step instructions. An attractive and handy addition to your Commodore 64.

*Only $9.95*

## Disk Tracker

Use Disk Tracker to catalog all of your disks into a neat filing system. Read and Edit each disk directory. Sort each directory and print disk jacket labels or a long master list of your programs. Display any directory at will. Search function finds lost programs quickly. Get your wares organized.

*Only $19.95*

## Check Tracker

Check Tracker is the fast acting versatile banking program that you have been waiting for to handle all your banking transactions. Handles checking and savings account at the same time with transfers and money machine functions. Each account can be divided into Business/Home/or Husband/Wife. Each item can be coded for automatic budgeting or automatic double entry bookkeeping with "T" accounts. Justifies the account; One or two drives; Automatic backup; Menu Driven... easy to use. Works great for simple home use or complicated business applications.

*Only $24.95*

## Variety Pac #1

A variety of spelling and math games all on one disk - Only $9.95

## Variety Pac #2

A variety of excellent BASIC games all on one disk -Only $9.95

## Adventure Pac

Forest Adventure, Desert Adventure, Miser's House, Haunted House, and more... all on one disk.

*Only $9.95*

## Utility Pac

Here is an assortment of the best disk utilities with complete instruction. Handy tools for the programmer or for the casual user. - Only $14.95

## Hot Tips

A disk full of Hot Programming tips, secrets, and useful sub-routines with documentation.

*Only $14.95*

## Address Tracker

Dedicated filing system designed specifically for names and addresses. Prints labels. Sorts on all fields. Works with Speedscript Utilizer to Merge labels and word processed text. Super-Easy to Use. A powerful addition to your software library.

*Only $19.95*

## Songs for Kids

25 Delightful, traditional childrens songs with words and 3 voice music. Everything from Hickory Dickory Doc to Farmer in the Dell. Ages 3-7.

*Only $14.95*

## Great Hymns

25 terrific hymns with words and music in 3 part harmony.

*Only $14.95*

## Bible Trivia

Bible Trivia is one of the finest trivia games available. 1000 questions, 1-10 players, exciting board game, question editor for making your own question files. You can even use it to make quizzes for your kids.

*Only $24.95*

## Speed-Script Utilizer

The Utilizer works along with your copy of the popular word processor, Speedscript. The Utilizer allows you to print multiple copies of your documents unattended. You can also merge a mailing list or other data file with your speedscript text so that multiple copies are printed changing names etc. on every copy. The powerful sort routine can be used to sort any Speedscript file into useful order. This program will work with any word processor that has sequential file options.

*Only $19.95*

## PS Graphic Pac #1

Here is a disk full of Original Graphics compiatible with the popular Print Shop program. A real plus for your graphics library.

*Only $14.95*

## Sound Tracks

A disk full of interupt driven, continual playing, sound tracks. Music and effects that you can use in your own programs. - Only $19.95

## Computer Furniture

Custom Computer Center designs that you can build from one or two sheets of plywood. Booklet includes scale patterns, material lists, procedures, and professional finishing tips. Attractive and easy to build - Only $3.95

# CHIPMUNK SOFTWARE



**Box 463**
**631 N. Cherry**
**Battle Ground, Wa. 98604**



**1-800-331-3428**

CALL

# DS/DD Disks 99¢

High Quality, Guaranteed, DS/DD, disks with tvyek sleaves, tapes, labels, and boxes - Only 99¢ each

**No Shipping Charges**

Add $2.00 for COD or Foreign Delivery.

**To Order Call - 1-800-331-3428**
**In Washington 1-687-2343**

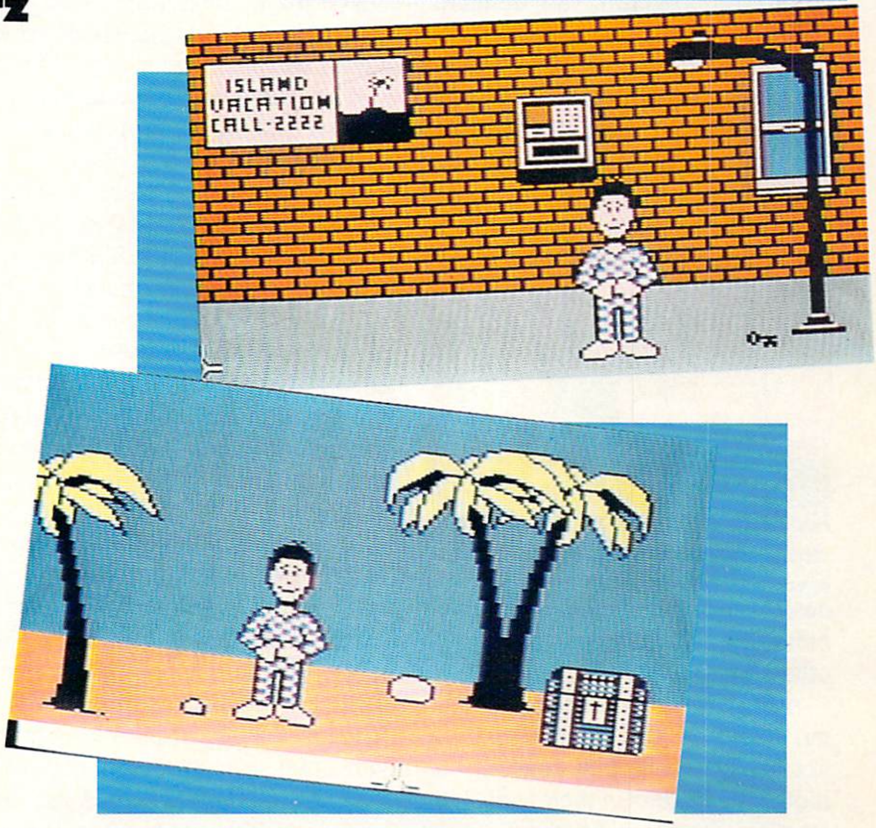
# WELCOME TO HABITAT

## An Introduction to the Ground-Breaking Telecommunications Game

### By Arnie Katz

Featured This Month:

Welcome to Habitat ....................................41
Super Cycle..............................................42
Spitfire 40 ..............................................43
JingleDisk/HeartWare/CardWare/Party-Ware/WareWithAll/Holiday Printpaper .....45
Psi 5 Trading Co. .......................................46
Mind Mirror .............................................48
Frankie Goes to Hollywood ...............................48




*Each human participant in Lucasfilm/QuantumLink's* Habitat *role-plays via an onscreen "avatar."* *READER SERVICE NO. 133*

The man who invented *Pong,* Sanders Associates' Ralph Baer, once said that the only three things worth doing with a home computer are entertainment, word processing, and telecommunications. This is probably a bit of an exaggeration, but there's no denying that these activities fill the majority of hours Americans spend with microcomputers in the home.

Combining gaming and telecommunications in one powerhouse package is a cherished dream that has been a long time turning into a reality. Computer gaming via modem is not a new concept, but technology has only reached the level needed to support a broad spectrum of games within the last year.

Online entertainment programs have existed almost as long as micros. Unfortunately, the quality of the games, especially the visuals, has been clearly inferior to the average piece of home computer leisureware.

The Source and CompuServe both offer a selection of online games, but entertainment is little more than a side-issue to these business-oriented operations. Most of their subscribers view the Source and CompuServe as productivity boosters and an economically attractive alternative to other modes of communication.

Though QuantumLink, which serves owners of the C-64 and C-128, is not the only entertainment-oriented network—PlayNET also emphasizes games—it is a striking contrast to rival networks. Parent company Control Video Corporation has targetted it squarely at the home market with a consequent emphasis on gaming, online chat, and hobby groups.

The Virginia-based service is introducing a brand new online game which represents the next great leap forward in entertainment telecommunications programs. *Habitat,* created by the fertile minds at Lucasfilm, is an authentic breakthrough which heralds the arrival of online gaming as a major part of the computer entertainment scene.

Although *Habitat* is still in the beta test phase at this writing, QuantumLink officials gave *Ahoy!'s* editors a hands-on demonstration of this remarkable game.

*Habitat* is a role-playing campaign in which each human participant controls an onscreen character known as an "avatar." As a device to heighten player-involvement, the gamer has some latitude in determining the appearance of his or her avatar. The user chooses a head and face from a databank which contains hundreds of possibilities and decides how the avatar should be dressed.

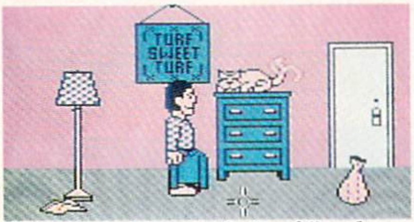
Each avatar owns a personal fiefdom called a "turf," which serves as a home base. The player can customize this turf in many different ways, including choosing the texture and color of every object within it. Stores in *Habitat* sell a selection of furniture to help do-it-yourself decorators. A well-heeled character can acquire such luxuries as a telephone which



*The* **Habitat** *player selects the head, face, and clothing of his/her avatar.*

pinpoints the locations of other avatars in the program's vast domain.

QuantumLink plans to set up a trust fund for each avatar so that no one has to spend his time in *Habitat* trying to earn a living. The avatar can draw the interest, but not the principal, to buy things. Treasure-hunters may increase their net worth by finding hidden bags of gold, and wheeler-




*For customizing one's "turf," or home base, stores sell assorted furniture.*

dealers may be able to work out financially advantageous trades with other avatars.

A citizen can stay home and putter, spend the day at the beach, go to city hall to collect information, visit other characters in their turfs, hunt for magic items and treasures, or just go exploring in search of experiences. Regions in *Habitat* include cities, suburbs, and even a fairyland with mushrooms as big as avatars. A projected add-on disk will make it possible to travel to alien planets and other dimensions.

There is no predetermined plot to restrict the scope of *Habitat*. Lucasfilm and QuantumLink have seeded



*Most of the game's excitement results from interaction among the avatars.*

this electronic universe with mini-adventures, but most of the excitement arises due to interaction among the avatars.

A major quest involves the search for a magic lamp. The genie inside will grant his liberator one wish. "Of course, it may not come true exactly as the player might wish," warns Janet Hunter, the Control Video executive in charge of the game.

The player moves an avatar with the joystick. Holding down the action button activates a four-choice menu that lets the avatar move around the screen, pick up or drop items, and perform specialized actions.

Several forms of communication are possible between avatars. Simply typing a comment puts it into an onscreen word-balloon which is visible by every other character in the region. By positioning the onscreen cursor directly over another character, a participant can send a private message to that particular avatar which others currently in the region cannot see.

The most controversial aspect of *Habitat* may be the inclusion of a deity known as the Oracle. The god of *Habitat* can wipe out an avatar's fortune, grant wishes, or curse the unworthy with the head of a donkey. Though QuantumLink's Hunter assures that such striking divine intervention will happen only rarely and after incredible provocation, the network expects some protests about the Oracle from the Petra Fellowship and other fundamentalist Christian groups. "We realize there is a potential for some problems," she admits.

The network will defend against criticism by pointing out that *Habitat*, for all its pseudo-realism, is just a game. Other role-playing systems, such as *Dungeons & Dragons*, have used deities, and CVC will assert *Habitat's* right to the same freedom of expression.

*Habitat* is the next generation of telecommunications gaming. Seldom has pioneering been so enjoyable.

Quantum Computer Services, Inc., 8620 Westwood Center Drive, Vienna, VA 22180 (phone: 703-448-8700 or 800-392-8200).

## SUPER CYCLE

**Epyx**
**Commodore 64**
**Disk; $39.95**

*Super Cycle* is not just a motorcycle racing contest, it's a time machine. Designer Stephen Landrum whisks computerists back to those thrilling days of yesteryear, when arcade-style games ruled the roost and the joystick jockey was king.

Those who lament the recent scarcity of action-oriented software can cure those entertainment software blahs by strapping on a helmet and gripping the handlebars of this 750-cc speed machine. *Super Cycle* provides relentless action with a dollop of strategy to keep players on their toes.

Although the nonstop pace of *Super Cycle* may remind veteran gamers of the classic videogames, the graphics of this solitaire contest are strictly contemporary. The player's bike, always in the foreground of the display, is marvelously detailed and, therefore, easily distinguished from competing cycles. The scenery is a little sparse, but the overall visual effect is pleasing to the eye without distracting the gamer's attention from the road during competition.

A much-appreciated frill is the on-track official, who drops the flag to start a new race. The control panel at the bottom of the screen also signals the cyclist that it's time to ride, but the visual cue makes the situation seem much more dramatic. Prior to hitting the track, the user picks one of eight colors for the bike and chooses the style and hue of the cyclist's outfit. The same utility screen offers a choice of three different levels of difficulty. Starting with any but the easiest is a good way to see the excellent crash explosions.

The computerist employs a joystick to steer the cycle. By pushing the stick forward and simultaneously hitting the action button, the rider shifts to a higher gear. If the button is pressed while the stick is in the neutral position, the cycle downshifts one gear. Three lights arrayed vertically on the instrument panel represent the chopper's gears. A yellow light indicates the one which is currently in force.



**Super Cycle:** ***a race against time.***
*READER SERVICE NO. 134*

The most enjoyable aspect of *Super Cycle* is the way author Landrum has captured the feel of riding a competition bike. The tiniest movement of the control stick can send the powerful racer skidding from one edge of the track to the other, while the onscreen rider leans way over to the side in an effort to prevent a complete crackup.

The gearing isn't just for show, either. The computerist must carefully watch the speedometer and make the changes at just the right point. Otherwise, the cycle slows to a crawl. Proper shifting is especially important at the start of a race or just after the crash, since seconds lost then can make the difference between a successful race and a nice try.

The gamer races against time. The other cycles on the track are obstacles, not true rivals for the checkered flag. The program presents six courses to challenge the electronic athlete's prowess. The cyclist must complete a course before time (about 1.5 minutes) expires to advance to the next-hardest track. Every third course is a bonus run in which the rider can earn extra points and time by knocking down the flags on the road.

The first course has few twists and turns, but the routes of the subsequent tracks are much trickier. The harder ones add pylons, puddles, ice slicks, and even wooden barriers. These force the rider away from the safe center portion of the road and necessitate frequent, dangerous lane-switches.

*Super Cycle* provides more exercise for the fingers than the brain, so it may not be every computerist's delight. Those willing to give this engaging action program a chance, however, will discover an exciting change-of-pace from a steady diet of brain-teasing adventures and intricate simulations.

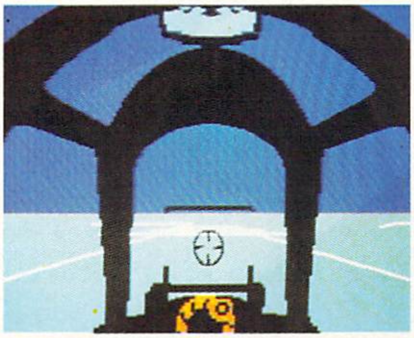
Epyx, 1043 Kiel Court, Sunnyvale, CA 90489 (phone: 408-745-0700).

*–Arnie Katz*

## SPITFIRE 40

**Avalon Hill**
**Commodore 64**
**Disk; $35.00**

Amateur pilots not wanted! Only World War II aces need apply. *Spitfire 40* not only tests flying and fighting skills, but the gamer's patience as well. Battling enemy aircraft is enough of a challenge without also



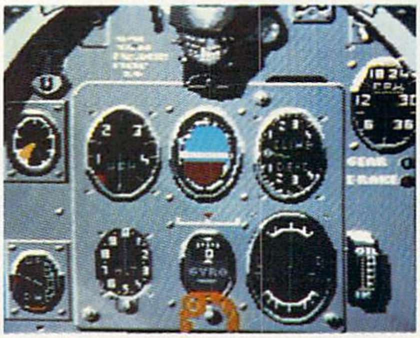
**Spitfire 40:** ***a wealth of detail.***
*READER SERVICE NO. 135*

having to fight the program itself, which seems bent upon keeping the computerist from doing whatever he or she is trying to do.

Few computer games have successfully combined the complexity of a flight simulator with the excitement of air combat. This disk doesn't really turn the trick, either, but it is an honorable try.

The Spitfire first rolled off the assembly line and took to the air on May 14, 1938. It was one of the mainstays during the Battle of Britain. If the controls for the real Spitfire were as difficult as presented here, Germany's planned air annihilation of Britain might have worked.

After the user decides whether to try the simulator or the dogfight scenario, the main display screen appears with a view from the cockpit. The player can look at the panel or out the windscreen, but not both at the



**Spitfire 40's** ***instrument panel is realistic but difficult to decipher.***

same time. The space bar toggles between views. In most instances, it is better to fly "blind" so that all the instruments are visible. The view outside is neither very impressive nor functional.

The most enjoyable aspect of this program is the incredible wealth of detail. It's an absorbing play-experience just to take off, turn right around, and land.

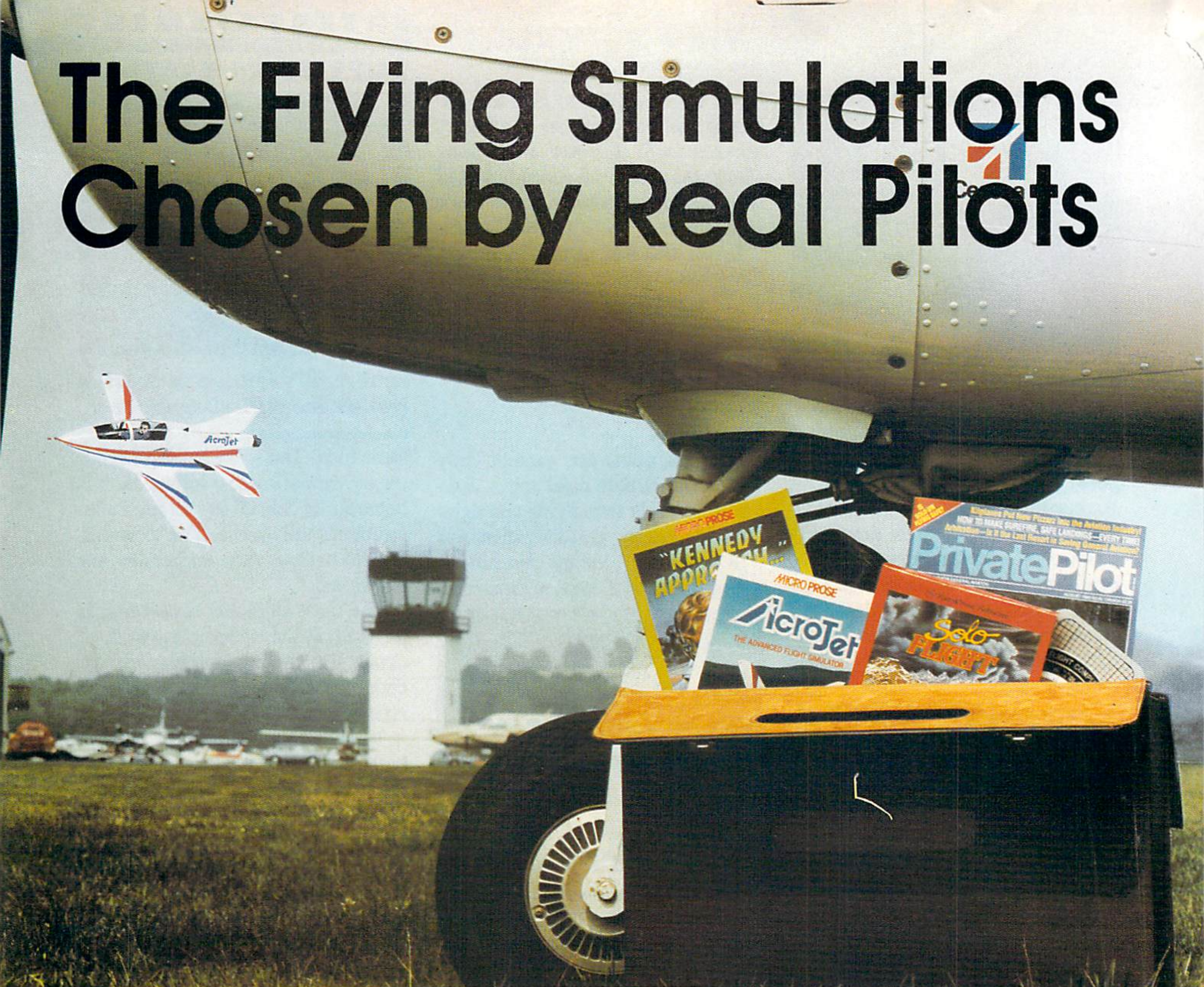
To launch the metal bird into the unfriendly skies, the computerist first engages the engine and raises the RPM to 1800. When the pilot disengages the brakes, the plane begins to roll and pick up speed. Then, the sound of the propwash fills the room. It is crucial to take off quickly at this point to avoid overheating, and to keep the plane from being damaged by the debris that's kicked up from the propwash.

The computer flier raises the RPMs to about 3000, waits for the air speed to reach 90, and then eases the joystick back. When the sound of the propwash fades, the plane is airborne and the user can tuck away the landing gear. Once the aircraft achieves a climb rate of 1000 to 2000 feet per minute, the stick can be returned to a neutral position.

All these moves would be even easier if the onscreen instrument panel were easier to decipher. A brief, yet informative pilot's notes and player's aid card makes the process of hunting up a gauge a lot easier. In an attempt at realism, the dials contain very few numbers. Therefore, the pilot must do a lot of guessing when the arrow lies between two marked points.

Controlling the pitch of the aircraft

# The Flying Simulations Chosen by Real Pilots










The toughest evaluators of flying simulations aren't computer buffs. They're actual pilots and flight professionals. And when these flyers talk authenticity and realism, one name comes up again and again: MicroProse Simulation Software. We're used to this kind of stringent comparison; our company president is a former fighter jock with 3,000 flying hours in his logbook.

Take the evaluation of Senior Editor David Martin, in *Private Pilot* magazine's August 1986 issue. Martin, a former Navy aviator who has flown almost everything with wings, reviewed five MicroProse programs, including the bestselling Solo Flight primary flight simulator. "I'd not have believed it possible . . ." he wrote, "Pilots of all sorts will be fascinated by these aviation games."

Mr. Martin isn't the only pilot who's spent many of his recent leisure hours with MicroProse simulations. Comparing his experience in training real flyers with the instrument layout found in Solo Flight, Cessna Flight Instructor Mark Rice told us "the instrument flying segments are very similar to the real thing – you're up in the clouds and using your readings to guide the aircraft."

Concorde pilot and former RAF jet flyer John Hutchinson reviewed Micro Prose' sport flight AcroJet for the British press. His conclusion: "this simulation is one that really does live up to its real-life counterpart . . . I find AcroJet completely absorbing and very exciting." High praise, from the man who flies the world's fastest airliner . . .

We regularly hear from military and commercial Air Traffic Controllers who rave about our Kennedy Approach simulation, and though we can't mention names (they're Federal employees), we can say that many of these professionals tell us Kennedy Approach is the most accurate depiction of airport conditions you can find short of a real control tower.

The MicroProse Civilian Aviation Series includes Solo Flight, which teaches the basic flying skills associated with a single-engine propeller aircraft. AcroJet recreates the sensitive control characteristics of the world's hottest sport jet – the Bede BD-5J – and includes a wide range of multiplayer competition events. Kennedy Approach allows you to guide dozens of commercial aircraft into and out of the nation's busiest airports.

From MicroProse: the flying simulators chosen not only by computer enthusiasts, but also by real pilots . . .

Solo Flight is available for Commodore 64™/128™, Apple II family, Atari XL/XE, IBM PC/PC Jr., and Tandy 1000. Kennedy Approach is available for Commodore 64/128 and Atari XL/XE. AcroJet is available for Commodore 64/128. All products have a suggested retail price of $24.95.

Available from your local retailer. If out of stock, contact MicroProse directly for further information on our full range of simulation software, and to place MasterCard/Visa orders.

Commodore, Apple, Atari, IBM, and Tandy are registered trademarks of Commodore Electronics, Ltd., Apple Computer, Inc., Atari, Inc., International Business Machines Corp., and Tandy Corp., respectively.

MICRO PROSE™
SIMULATION • SOFTWARE
120 Lakefront Drive • Hunt Valley, MD 21030 • (301) 771-1151

Reader Service No. 152

is particularly challenging. No matter what the plane's altitude and speed, it is very tough to keep the nose level. This reviewer tried several joysticks to make sure it was not a mechanical problem, but the plane responded cantankerously to all control devices. Failure to watch the vertical speed indicator closely could have "grave" consequences.

The second problem involves navigation. The entire patrol area map appears at the touch of a key. Unfortunately, the map doesn't provide much information. The chart offers three scale-settings, but none is very illuminating.

In actual play, most pilots will want to watch the instruments while they adjust the flight path, and then return to the map to see the effect of such changes. It's not a good idea to make changes while the map is displayed, because the program doesn't continuously update the view. The chart doesn't scroll and lacks a compass rosette, so it's nearly impossible to get back to a specific area if the plane flies off the beaten path.

Another drawback becomes obvious when playing the battle portion. The indicators don't show information about the altitude of enemies relative to the computerist's ship.

One nice feature is the flight log. Difficulty is calculated for each individual user. Prior to play, the computerist formats a blank disk on which the program records that player's flight hours and success. The more flight time and the more kills in battle, the more difficult the game and the more skilled the enemy pilots become. Avalon Hill provides a certificate of merit for anyone who logs 60 hours in the air.

*Spitfire 40* offers C-64 owners two games in a single package. Although neither the simulator nor the battle scenario is the best available, the program as a whole provides a pleasing variety of action for those who want their flying and their fighting on the same disk.

Avalon Hill Microcomputer Games, 4517 Harford Road, Baltimore, MD 21214 (phone: 301-254-5300).

*—Rick Teverbaugh*

**JINGLEDISK $6.95**
**HEARTWARE $9.95**
**CARDWARE $9.95**
**PARTYWARE $14.95**
**WAREWITHALL $14.95**
**HOLIDAY PRINTERPAPER $9.95**
**Hi Tech Expressions**
**Commodore 64; Disk**

The holiday season is almost here, bringing with it a universal need for attractive greeting cards. There is something special about a homemade card, and these programs can help even those who can't draw a Christmas tree design customized greetings packed with the holiday spirit.

ThoughtWare started this branch of computer design almost by accident. The company created *JingleDisk* as an electronic card to send to clients. Recipients praised it so enthusiastically that ThoughtWare launched a new division, Hi Tech Expressions, to create similar products for home use. The original program, now updated with new graphics, has become the flagship of an entire line of programs for making cards and associated party supplies.

It's not surprising that *JingleDisk* sparked so much excitement. It's stuffed full of seasonal paintings that make the Commodore burst with Christmas cheer. A six-minute illustrated story unfolds onscreen, detailing the adventures of a mouse, a cat, and a tin soldier. The trio's hijinks in front of the fireplace and decorated tree, accompanied by seasonal carols, would bring yuletide smiles to Scrooge.

*JingleDisk* contains a simple cardmaking option along with the animated holiday tale. It prepares an illustrated, folded card, with a clever graphic of the mouse hiding in a stocking hanging on the tree. The computerist can type in the names of sender and recipient.

*HeartWare* provides a three-minute animated friendship demo-message, music, and a card-printing function to prepare folded or full-page greetings. Users can also make a self-booting disk with a personalized greeting to send to friends and lovers.

The graphics available are sentimental in tone. Folded cards can be




*Do-it-yourself cards, party goods, etc.*
*READER SERVICE NO. 149*

illustrated with nesting lovebirds, snails, fish, or a sun-drenched tree. Full-pagers include a picture of a forest pond with rainbow, a heart pierced by Cupid's arrow, and an underwater scene.

*CardWare* makes everyone's birthday a more special occasion. A three-minute animated story details a shopping spree. The disk maker function creates animated self-booting greetings to send to computing friends. The cardmaking options have five child-pleasing graphics for folded cards, including teddy bear, rag doll, roses, birthday cake, and toy train. Full-page scenes include a pretty village, birthday candles with the recipient's name, and a baker holding a birthday cake.

*PartyWare*, a two-disk set, is a complete party design and greeting card kit. The built-in disk maker function creates personalized messag-

es framed by animated graphics. Printing functions create cards, note paper, place mats, banners, invitations, place cards, party hats, prize ribbons, and a party check list. The package even includes ideas for games and a database to store a guest list of up to 60 names. There's room to save nicknames, addresses, phone numbers, and the dates of two special events, such as anniversaries and birthdays.

To accompany these special programs, Hi Tech created *WareWithAll* and *Holiday Printerpaper.* These two packages have everything the computerist needs to make the greeting cards look more professional.

*WareWithAll* contains four kinds of designer printing paper: 20 sheets each of polka-dotted, star-spangled confetti-bordered, and heart-trimmed paper. Also included are greeting card envelopes, magic markers for addressing letters, a special gift disk, and some decorative stickers.

*Holiday Printerpaper* has three styles of paper that work with any print utility product. There are 50 sheets each of Christmas trees, snowflakes, and holly. *Holiday Printerpaper* also comes with a special graphics disk that contains more art for use with *PartyWare.*

The programs all operate smoothly, and their low price is no reflection on their solid quality. The resulting greetings, whether on disk or paper, are bound to make the holidays more cheerful.

Hi Tech Expressions, ThoughtWare, 2699 S. Bayshore Dr., Suite 1000A, Coconut Grove, FL 33133 (phone: 305-854-2318).

*–Joyce Worley*

## PSI 5 TRADING CO.

**Accolade Entertainment Software**
**Commodore 64**
**Disk; $29.95**

Travel lanes crisscross space in the 35th century. Ships transporting cargo and passengers fill the skyways of the galaxy. Brisk commerce between the intelligent races of the known planets keeps freighters zipping through the shipping lanes. A captain with a good crew has a chance to amass a fortune shepherding goods from one port of call to another.

Alas, there's more in space than friendly transports and passenger ferries. Along the Parvin Frontier, a mining quadrant populated by settlers, entrepreneurs, and social misfits, cargo pirates prey on legitimate travelers. These space thieves will clear a hold of its wares before the captain can say, "Who goes there?"

Wise leadership might crew the ship, choose a mission, and win through to the destination with cargo and freighter intact. Odds are that something will go amiss. Equipment failure, delays, and personnel problems are bad enough, but just when the captain's hands are full coping with these workaday emergencies, the pirates add the final straw to his backbreaking load. It's not easy to get rich, even in the future!

*Psi 5 Trading Co.* casts the computerist as commander of a cargo freighter, trying to earn an honest buck by delivering goods to Parvin planets. Designer Mike Lorenzo, best known for his videogame hits *(Oink, Circus, Golf)*, has created a complex spaceship and an exciting roster of characters to act as crew. The resulting simulation calls for good judgment and steady nerves, but even these attributes may not be enough to overcome the problems that confront the *Psi 5* player.

The captain first chooses the course from a menu of several possible assignments. The roster lists the distance, cargo, and projected payment for completing the mission. Since the rewards are proportionate to the risks, it's best for novice pilots to start with a simple destination until management of the ship and its personnel becomes automatic. The experienced space skipper can then tackle one of the higher-paying long hauls.

The specialists of the crew run five key positions which go far to determine the success or failure of the enterprise. Choosing the right human, alien, or vaccdroid worker for each spot is an important part of the game.

There are six candidates for each department position, shown on the screen as a rogue's gallery of photographs. The candidates' resumes list name, nickname, age, marital status, qualifications, educational background, experience, strengths, and weaknesses.

The player must evaluate these spacedogs' histories and hire officers for the Weapons, Scanning, Navigation, Engineering, and Repair Departments. It isn't always easy to assemble a crew that works well together. As in the real world, expert skills in one area often go with deficiencies in others. Sometimes a strong candidate has grave personality flaws which make it difficult for him or her to fit into shipboard life.

The captain's communications console, which fills the display screen, provides all the data needed to run the mission and maintain contact with the ship's personnel. Graphic artist Mimi Doggett did an exemplary job producing this attractive and easy-to-use screen.


**COMMODORE 64™**

SUPER SOFTWARE

**New! Best of Games #3**
Over 40 new games on 2 disks.
**$17.95**

**New! Brain Games #1**
Includes: "Stock Market," "City Manager," "Warehouse," Civil Battles" and many more fun Brain Games.
(12 Huge Programs) **$12.95**

**New! Adventure #1**
Includes: "Gladiator," "Trip to Atlantis," "Merlyn" and many more Adventure Games.
(13 Huge Programs) **$12.95**

**Best of Games #1**
The original. Over 50 games on 2 disks.
**$17.95**

**Las Vegas #1**
The Classic. Over 20 Las Vegas Games. Bestselling disk.
**$12.95**

**New! Education #1**
Great for schools. For kids between 5-15 years of age.
**$12.95**

**Mixer #1 or #2**
Two separate disks. Each with 20-30 different programs.
GAMES — MUSIC — BUSINESS/UTILITIES
Each Only **$9.95**

**Synthesizer Sounds #1**
Over 50 well conducted rock songs on 2 disks.
**$17.95**

ADD $2 ($3 FOREIGN EXCEPT CANADA) SHIPPING/HANDLING
SEND CHECK OR MONEY ORDER TO:

GSR
SOFTWARE COMPANY
**538 So. 2nd St. • Albion, NE 68620**

Commodore 64 is a trademark of commodore electronics ltd.

Reader Service No. 162

The upper left half of the screen looks out on space, and the scene changes from forward to aft to monitor traffic coming and going. The communications screen is on the right half of the display. This displays a picture of the department head to whom the captain is talking.

A band of indicators across the middle of the screen monitors the ship's functions, including shield and battery indicators, temperature, weapons and supply information, and speed and compass readouts. Unfortunately this band of dials and gauges is so densely packed that they are difficult to interpret. The savvy computerist will memorize what each symbol means.

Below this tightly packed data strip, a second band lists the departments. Selecting one initiates communication with that section's manager.

The information window in the lower half of the screen reveals data and a steady battery of incoming messages from the onboard specialists. Shifting among the sectors, the captain examines the status of activities in each department via his telecommunications screen, and assigns work.

It takes constant monitoring of all the ship's departments to properly prioritize work assignments and insure top efficiency. The Scanning Department keeps track of other space vehicles and identifies their positions, class of people, and whether they are friends or foes. The Weapons Department displays the type of munitions available and executes attack commands. The Navigation Department shows the possible courses, estimated time of arrival at the destination, risk factors, and speed. Engineering allocates power to the parts of the ship where it's most urgently needed. Finally, the Repair Department, with its crew of robodroid assistants, fixes all damage sustained.

The graphics are the best part of the program. The viewport creates a satisfactory illusion of interplanetary travel, and the communications console is sparked by clever bits of animation. The crew members are depicted as a satisfying mixture of human, alien, and robotic lifeforms. The keyboard or joystick controls all gaming options, and it is easy to move between departments with the communications device.

It is not easy to master the ship's controls, nor to determine the perfect allocation of power to keep the freighter alive, defended from enemies, and on time. Unfortunately, most gamers will fail again and again before they are able to complete even one expedition. The training mission guide included with the documentation lacks the detail necessary to adequately teach new pilots. Many players will give up before they get the hang of it.

Once the gamer does gain control of the ship, *Psi 5 Trading Co.* is not quite as exciting to play as its appearance might suggest. Beneath the fancy visuals, *Psi 5* is a complex simulation which requires the user to juggle a lot of factors during the course of a mission. Gamers who don't favor this sort of mental acrobatics might prefer a more action-oriented program. Those who do like complex strategy contests, however, will enjoy many problem-filled missions as




Psi 5: *mental acrobatics required.*
*READER SERVICE NO. 136*




*Information window displays data, incoming messages from specialists.*

they explore the frontiers of space.

Accolade, 20863 Stevens Creek Blvd., B-5/E, Cupertino, CA 95014 (phone: 408-446-5757).

*—Joyce Worley*

COPY II 64/128™

**BACKUP PROTECTED SOFTWARE FAST.**

From the team who brought you COPY II PLUS (Apple), Copy II PC (IBM) and COPY II MAC (Macintosh) comes a revolutionary new copy program for the Commodore 64 and 128 computers.

- Copies many protected programs—automatically. (We update Copy II 64/128 regularly to handle new protections; you as a registered owner may update at any time for $15 plus $3 s/h.)
- Copies even protected disks in under 2 minutes (single drive).
- Copies even protected disks in under 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12-second format.

Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

**Call 503/244-5782,** M–F, 8–5 (West Coast time) with your VISA/MasterCard in hand. Or send a check for $39.95 U.S. plus $3 s/h, $8 overseas.

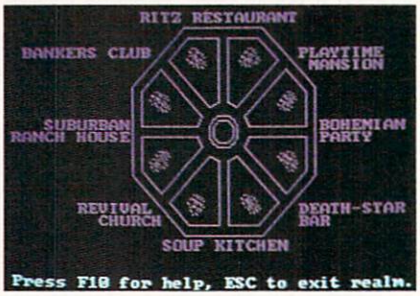
**$39.95**

Central Point Software, Inc.
9700 S.W. Capitol Hwy. #100
Portland, OR 97219

Central Point Software INCORPORATED

*Backup utilities also available for the IBM, Apple II, Macintosh and Atari ST.*
*This product is provided for the purpose of enabling you to make archival copies only.*

Reader Service No. 137




Mind Mirror: *substance beneath hype.*
*READER SERVICE NO. 138*

## MIND MIRROR
**Electronic Arts**
**Commodore 64**
**Two disks; $32.95**

Timothy Leary's *Mind Mirror* represents the ultimate computer expression of pop psychology. The man who led a generation of pharmaceutical experimenters in the 1960s has turned to software for mental expression in the 1980s.

The front cover shows a hand bearing a crystal ball against a post-rainstorm sky. Within the crystal stands Dr. Tim. His face is distorted slightly by the globe's fish-eye effect, but remains instantly recognizable. He is depicted in Yuppie Heaven: a modernistic habitat of white walls, clean lines, and "raw-look" wood. A caveat tacked to the shrinkwrap promises that this software "can be hazardous to your stereotypes." The copy on the back cover actually invites consumers to "Tune in, turn on, boot up."

If all this strikes software cynics as a terminal case of computer hubris, the impression is erroneous. As is so often the case with Dr. Leary, there is a surprising amount of substance beneath the outrageous hype.

*Mind Mirror* is a fine example of a genre now attaining popularity among computerists: the life simulation. Like Dr. Peter Favaro's *Altèr Ego* (Activision), this program explores the entertainment possibilities of vicariously experiencing life through another's eyes.

*Mind Mirror* offers three types of activities. First, the user learns to create the "mind maps" which serve as the basis for the program. The second segment of *Mind Mirror* applies the concept to "real" life. The computerist creates mind maps of movie stars, athletes, politicians, and the like and then runs these simulacra through a series of exercises on subjects like "Religious Tolerance." Finally, the user actually steps inside the construct for a walk through an actual life experience. To sample the full ramifications, create a mind map of Ronald Reagan, and then check out a punk rock club. Or how about going on a job interview as Boy George?

Events are described in prose. There's some visual stimulation, however, in the form of beautiful neo-psychedelic transition sequences. They're guaranteed to remind older Commodore owners of a 1960s rock concert light show.

The package includes a booklet that is almost worth the price of admission. Dr. Tim convincingly demonstrates that there's still lots of spring in his synapses with a brief history of human thought that says more in a couple of pages than many philosophers speak in volumes. *Mind Mirror* reflects Dr. Leary's view that mankind has passed beyond the "mechanical thought" patterns of the post-Gutenberg era, into the age of "electronic thought." "Just as the industrial age replaced the one-tool-at-a-time hand craftsmanship with toolmaking machines, now the mechanical thinker–the PhD "man of letters" (who laboriously wrestles heavy Macro thoughts in and out of wood-pulp paper)–is being replaced by the electronically literate person who has access to a thoughtmaking program," explains the Doctor, who elsewhere refers to his program as a "thought processor, headware for the computer generation."

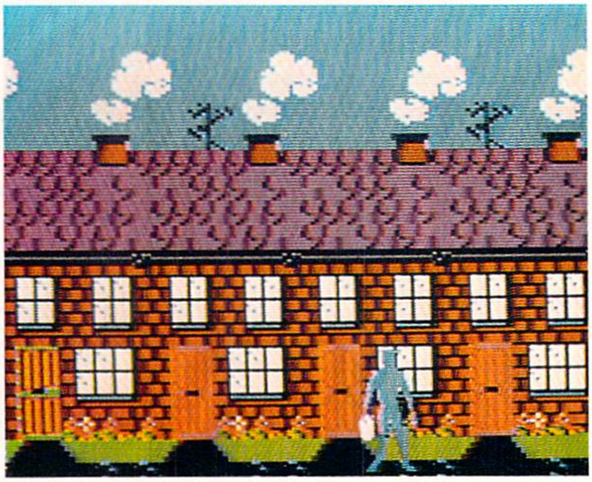
*Mind Mirror* is a piece of software that does something genuinely rare: It enlightens while it entertains.

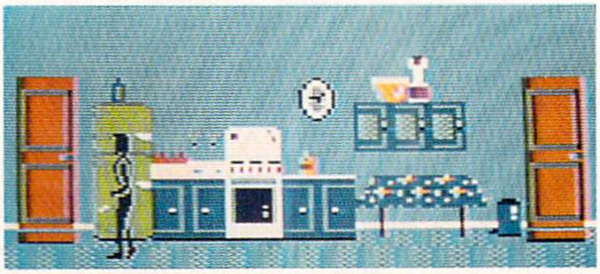
Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404 (Phone: 415-571-7171). *–Bill Kunkel*

## FRANKIE GOES TO HOLLYWOOD
**Firebird**
**Commodore 64**
**Disk; $34.95**

"Relax," urged the British pop group, Frankie Goes To Hollywood, in their biggest hit song. Unfortunately, no one told the design team that too much relaxation might be injurious to the finished program. After bopping to a peppy computerized version of the title song, the computerist can play this contest for hours without experiencing even the slightest resistance from the characters or

**Frankie Goes to Hollywood** *requires the player to advance from Mundanesville to the Pleasure Dome by collecting four pills which, when consumed, either double pleasure or halve pain.* *READER SERVICE NO. 139*





*The rooms the player passes through contain clues which must be interfaced with devices found elsewhere.*

situations.

*Frankie Goes To Hollywood* is yet another in an endless string of British-produced action games which shamelessly ape Epyx's classic *Impossible Mission.* Once again, Anglo designers have concocted a scenario in which a player-surrogate moves through a seemingly infinite series of corridors and rooms.

As usual, the rooms contain clues—sometimes out in the open, sometimes hidden—which the player must collect. Some of these objects must be interfaced with other devices located elsewhere within the game. For instance, a videocassette can only be played on a VCR, and a computer disk must be booted on a compatible micro system.

*Frankie Goes To Hollywood* pulls out all the stops in terms of game gimmicks. It adheres faithfully to the philosophy that "more is better." Many British computerists believe that the more rooms, puzzles, and required tasks a game contains, the better value it is.

In a sense, this is true. Unfortunately, it doesn't say much about the quality of the games which this quantity-oriented approach generally produces. Those who want a really sprawling action-adventure, even at the cost of inventiveness and originality, should enjoy this.

A fair example of the "kitchen sink" approach used to design *Frankie Goes To Hollywood* is the murder. Near the start of the game, the player stumbles upon a dead body. Thereafter, clues appear as the character continues to move through the corridors. These clues contain information about the suspects and the murderer.

Clues concerning possible suspects might inform the player that "Miss Blofu is a vegetarian," or that "Capt. Klack is illiterate." Elsewhere, the game provides information about the killer like "The murderer left behind a cookbook: '50 Ways To Prepare Penguin.'" The player must correlate the various pieces of information to pinpoint the criminal.

Despite the nagging sensation that most of this program's "original" elements are cleverly disguised borrowing from *Impossible Mission,* Frankie does demonstrate some inventiveness. The player must try to make the leap from "Mundanesville," an appropriately ordinary suburb, to the arcadelike Pleasure Dome. The computerist can't go to the Dome without first becoming a complete person by collecting four types of pills which, when consumed, either double pleasure to halve pain. These pharmaceuticals, combined with actual experiences, increase the player's status as a "real person." Frankie Goes To Hollywood (the group), which acts collectively as the game's deity, periodically grants "pleasure units" and announces the player's new status (i.e.: "The player is now 20% a real person.")

The idea that pills, represented by icons which resemble a ribbon, a hypodermic needle, a heart, and a cross, make people more "real" is fairly remarkable. *Frankie Goes To Hollywood* is supposed to be controversial, but its seeming advocacy of wide-spectrum drug-taking may be going a little far. Parents may well want to use discretion or, at the least, discuss the theme of the program with young computerists.

Another problem is that it takes an eternity to reach the Pleasure Dome. Adding salt to the wound is the fact that *Frankie* can't be saved, which means the player must retrace the same tortuous route each session.

A much worse drawback is that the gamer doesn't face a single serious challenge during the entire tour of Mundanesville. The player simply moves from room to room, searches for objects, and takes them. The only decision for the computerist is which item to discard when the character can't carry any more. There's no time limit or hostile force which impels the player to keep moving and work fast, yet this scavenger hunt is too simple to require the gamer to ponder each move for more than a few seconds. Where are those killer robots from *Impossible Mission* now that we need them so badly?

The graphics delineate every onscreen object in marvelous detail. The icons, which are virtually ignored in the documentation, are well-drawn, but the symbolism is a little murky. The cross obviously represents religion, but what does the hypo symbolize? If the needle is supposed to stand for health or medicine, some less flagrant image might have been a better choice.

*Frankie Goes To Hollywood* is a game with a lot of promise, all of it sabotaged by the lack of any genuine conflict in the long introductory sequence. There's plenty to do and see, but after a few hours of seeing and doing it, the thrill is gone.

Firebird Licensees, P.O. Box 49, Ramsey, NJ 07446 (phone: 201-934-7373). *—Bill Kunkel*

**Reviewed Next Month:**

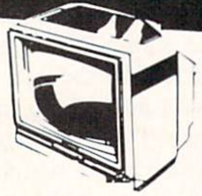
- **Ultimate Wizard**
- **Financial Time Machine**
- **Macbeth**
- **The Arc of Yesod/The Nodes of Yesod**
- **Battlefront**



Reader Service No. 165

# PRO-TECH TRONICS

## MONITORS



RETAIL
$120

**$59**

GREEN SCREEN

RETAIL $299

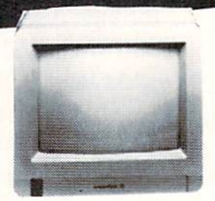
**$99**



FULL COLOR

RETAIL $400

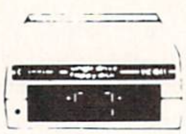
**$238**



RGB

## DISK DRIVE

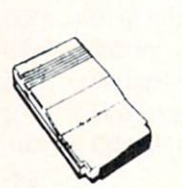
1541
COMMODORE



**$139**

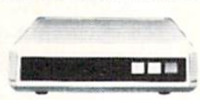
## MODEMS

300
BAUD



**$28**

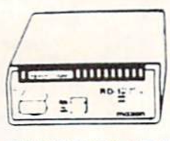
1200 BAUD
HAYES COMPATIBLE



**$88**

## RADAR DETECTORS

HIGH
PERFORMANCE



SUPERHET

RETAIL
$249

NOW

**$78.00**

FREE HOME TRIAL

## VIDEO

VHS-HQ



CAMERA
& VCR
ALL IN ONE!

- LOW LIGHT
- LIGHT WEIGHT

**$1299**

$1600
RETAIL

## CABLE TV?

NO
PAY TV?

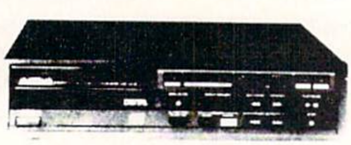
CONVERTERS/
DECODERS

- JERROLD
- OAK
- HAMLIN



*CALL TODAY FOR PRICE*

## COMPACT DISC PLAYER



*"TOP OF THE LINE"*

RETAIL
$289

**$169**

FREE HOME TRIAL

**CALL TODAY 1-800-345-5080**

# COMMODORE

# C-64 COMPUTER

NEW UNITS



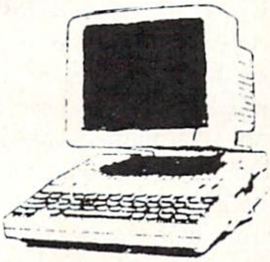
# $99

*WITH PURCHASE OF OUR SPECIALLY PRICED SOFTWARE

## COMPUTER

**128k**

INCLUDES
DISK DRIVE



**$395**

**Laser 128**

**FREE HOME TRIAL**

## PRINTERS



RETAIL
$200
**$69**

COMMODORE

FREE HOME TRIAL




NEAR LETTER QUALITY

**$149**

## POWER SUPPLY

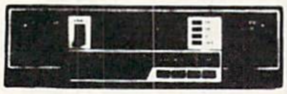



**$39**

C-64

## CAR STEREO

FM/AM CASSETTE



**$39**

FREE CAR TRIAL

**QUICK DELIVERY**



MasterCard  American Express  VISA  C.O.D.

SCHOOL P.O.'s ACCEPTED

**PRO-TECH-TRONICS**
6870 Shingle Crk. Pkwy. #103
Minneapolis, MN 55430
(612) 560-6603

Reader Service No. 153

# SYNTAX PATROL



## Instant Error Detection for the C-64

### By Buck Childress

Snap! Crackle! Pop! No, that's not your cereal bowl talking to you. It's *Syntax Patrol* zapping the bugs out of your programs. *Syntax Patrol* knocks those bugs out before they get in. It keeps an eye on the syntax of each line as you enter it and stops those errors cold. No more marathon debugging sessions. No more unusual verbiage emanating from the mouth. Will computing ever be the same?

Use *Flankspeed* (page 121) to enter *Syntax Patrol*. After saving the program to disk, reset the computer and LOAD"SYNTAX PATROL",8,1. When it's through loading, type NEW and press RETURN. Then type SYS 51000 and press RETURN. That's all there is to it. *Syntax Patrol* is on patrol. Now whenever you enter a program line and press RETURN, *Syntax Patrol* checks for errors and lets you know immediately if any exist. The line won't be added to your program until it's error free. It's as simple as that.

*Syntax Patrol* is really handy for digging out those no-nos in an existing program, too. If one of your programs has the Syntax Blues, just load it up and list it, place the cursor on the first line, and start pressing RETURN. Zip, bam, pow...you'll find those typos, bleeps, and blunders in no time flat.

As an added feature, *Syntax Patrol* is fully compatible with the *Failsafe* automatic program saver (May '86 *Ahoy!*). You can keep the bugs out as you go and have those spiffy program lines saved automatically. To use them together, just load and run *Failsafe*. Now load and activate *Syntax Patrol*. By the way, whenever you activate *Syntax Patrol*, you're asked if you want to use *Failsafe*, too. Press the N (no) key if you don't or the Y (yes) key if you do.

If you choose yes, *Syntax Patrol* first checks to see if *Failsafe* has been loaded, and lets you know. Then it makes the necessary adjustments in *Failsafe* so they'll work together automatically. Now you can just program to your heart's content. After 15 minutes, *Failsafe* waits for you to press RETURN on an error-free line. Because a save won't take place on a messy line, your gem stays nice, neat, and pest free.

To deactivate the utilities, type SYS 51000 and press RETURN. SYS 51000 turns *Syntax Patrol* on and off. And, because *Syntax Patrol* controls *Failsafe*, it also deactivates *Failsafe*. *Syntax Patrol* returns *Failsafe* to its original state so, if you want, you can use it alone.

Here are a few things to remember. *Syntax Patrol* checks the syntax of your program. It'll find the typos (e.g., PKOE instead of POKE), improper punctuation, missing parentheses...just about everything you're likely to come across as a BASIC programmer. It's up to you, though, to make sure that your program is sound. For example, if you have a NEXT command in your program, you must have a FOR command somewhere in there, too. *Syntax Patrol* accepts NEXT as a proper command, but a missing FOR won't show until the program is run, and vice versa. The same holds true for other types of commands such as FNA(X), PRINTB$(20), READA, etc. They're all syntactically correct. But, if somewhere in your program you haven't defined the function or dimensioned the array, or you don't have enough data, you'll get an error when your program is run. Unfortunately, there's no way that *Syntax Patrol* can anticipate what you will have in your program. If you watch this part, *Syntax Patrol* will do the rest.

*Syntax Patrol* is a machine language program that uses an area of RAM totally separate from BASIC. Although, in most cases, you can load, save, and run programs on a non-interference basis, it's a good idea to deactivate *Syntax Patrol* first, just to be on the safe side. Remember, SYS 51000 alternately switches it on and off.

Put *Syntax Patrol* on the job. Your programs will be so clean they'll squeak.

*SEE PROGRAM LISTING ON PAGE 128*


V3.0 ULTRABYTE DISK NIBBLER

NEW SIXTH GENERATION ULTRABYTE COPIER FOR COMMODORE 64 and 128 ( in 64 mode )

- Copies 99+% of protected software in 2 min. or less includes parameters for 160 recent, hard-to-copy disks. ( Send stamped envelope for list ). Includes fast file copy program
- Uses 1 or 2 1541 /1571 drives, or MSD dual drive
- More powerful than KeyMaster, Diskbuster, Copy II, Superkit, 21 Second, Clone or Cracker
- Copies itself ( for this reason, no refunds given )

SPECIAL — BUY A NIBBLER V3.0 AND GET YOUR CHOICE OF A FREE $14.95 PROGRAM
$39.95 plus $4.00 shipping

Disk Surgeon -- disk utility ............... $14.95
Ultramail -- mail list and label printer..... $14.95
McMurphy's Mansion -- text adventure .... $14.95
Handy-Capper -- race handicap system ... $14.95

( Above may be ordered separately for $14.95 plus $4.00 shipping. Foreign orders add $2.00 )

Mastercard, Visa, Check or M.O., Calif. add 6.5% ( $2.60 ) sales tax. Foreign orders / COD add $2.00. Payment must be in U.S. funds

UPDATES - Return your original Ultrabyte disk with $10.00 plus $4.00 shipping. Foreign add $2.00

To order, write or call 24 hr. order line. For info. write.
ULTRABYTE ( 818 ) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

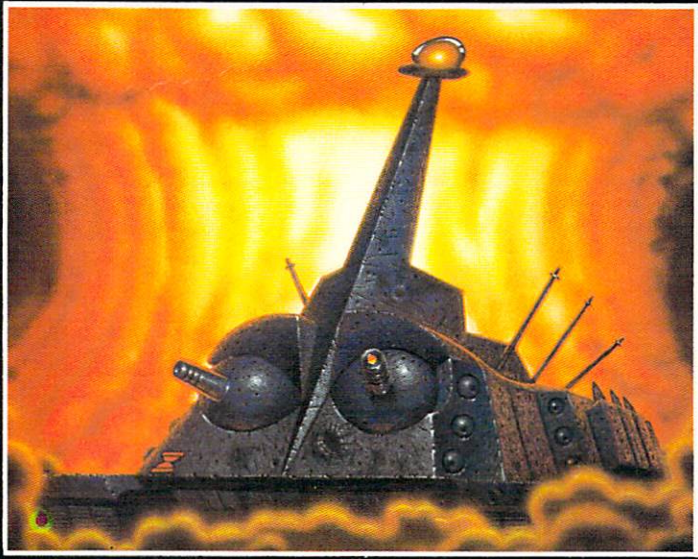
Reader Service No. 174

Origin Systems,
creators of the award-winning Ultima® series, presents:

# OGRE

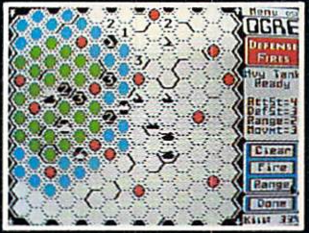
Available on Apple®

## Total war against a juggernaut fighting machine by Steve Meuse



A strategy game for one or two players, OGRE pits an array of infantry and armored forces against a single cybernetic supertank, bristling with weapons—the OGRE.

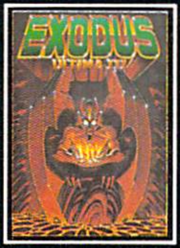
Adapted from the classic Steve Jackson board game, Computer OGRE epitomizes simplicity and play balance. Players can use standard game maps or design their own.



Using the RANGE option, a heavy tank considers its move and fire range.

OGRE—
the challenge of a lifetime is waiting.

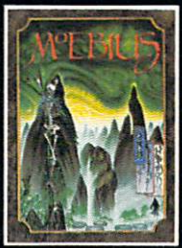
ORIGIN SYSTEMS INC. 340 HARVEY ROAD, MANCHESTER, NH 03103 (603) 644-3360




ULTIMA™ III sends you on an incredible fantasy role-playing journey through monster-plagued Sosaria in search of the elusive Exodus.




ULTIMA™ IV is the long-awaited sequel to Ultima™ III. The Quest of the Avatar is a quest to the final frontier—the self.




MOEBIUS™ takes you through the elemental planes of a colorful Oriental world of fantasy and adventure in search of the Orb of Celestial Harmony.




AUTODUEL™ is a futuristic fast-paced strategy role-playing game where the right of way goes to the biggest guns.

OGRE and Autoduel are registered trademarks of Steve Jackson Games, Incorporated. Ultima is a registered trademark of Richard Garriott. Moebius is a trademark of Greg Malone.

Authors wanted. Call us today.

# Great Software for Under $7.00...

Now is your chance to build your software library at a *very* reasonable cost! For **ONLY $6.99** you can get software for your Commodore or Apple computer. Choose from entertainment, home management or education titles.

**Save $1.00** on a 10-pack of DS/DD **Blank Diskettes** with any merchandise order over $10.00.

## For the Commodore 64/128

**Entertainment Series**

C-1 Memory Quest
C-2 Sky Fighters
C-3 Atomic Challenger
C-4 Professional Gambler
C-5 The Survival Instinct
C-6 Arcade Action
C-7 Adventure Master
C-8 A PACaLIPS NOW
C-9 Bits, Pieces and Clues
C-10 Board Games 1
C-11 Board Game Challengers
C-12 Chess Champion
C-13 Crazy Corners
C-14 Galactic Empire Builder
C-15 Just Games (With a Twist!)
C-16 Land, Sea & Air Adventures
C-17 Maze Madness!
C-18 Peg Out (The Cribbage Game)
C-19 Star Trek Evolution
C-20 Trivia Quest
C-21 Open— Golfing Royal St. George's
C-22 Alien
C-23 Bulge—Battle for Antwerp
C-24 Wizard & the Princess
C-25 Ulysses & the Golden Fleece
C-26 Mission Asteroid
C-27 Passport to London
C-28 Passport to Paris

**Home Management**

C-30 Vital Data Keeper
C-31 Wordmaster Senior
C-32 Master Word
C-33 Personal Spreadsheet
C-34 g'BASE, database manager
C-35 My 64—A Computer Tutor
C-36 Commodore 64 Utilities
C-37 Financial Analyzers
C-38 Home and Business Card File
C-39 Home Expense Manager
C-40 Home Finance Organizer 1
C-41 Home Finance Organizer 2
C-42 Home Income Manager
C-43 Home Money Manager
C-44 Home Property Manager
C-46 Personal File Keeper
C-47 Personal Investment Manager
C-48 Family Tree
C-49 Electronic Scheduler
C-50 Pro Financial Organizer
C-51 Recipe Box
C-52 Tax Record Organizer

**Education Series**

C-53 Number Builder
C-54 Number Chaser
C-55 Hide & Seek
C-56 Picture This
C-57 Let's Count
C-58 Time Trucker
C-59 Fancy Face
C-60 Math Manor
C-61 Typing Tutor
C-62 Speed Reader

**Electric Book Co. Education Series**

C-63 Why?
C-64 When?
C-65 The Three Bears
C-66 Gingerbread Man
C-67 Baby Animals
C-68 Hoppy the Curious Kangaroo
C-69 Wild Animals
C-70 Tom Thumb
C-71 I Was a Second Grade Werewolf
C-72 Tough Eddie

## For the Apple II+, IIc, IIe

**Entertainment Series**

A-1 Beginner's Cave, an Adventure
A-2 Cave of the Mind, an Adventure
A-3 River Adventure, an Adventure
A-4 Fore!, Golfing Simulator
A-5 Lady Luck
A-6 Space Adventure
A-7 Classic Games
A-8 Android Invasion
A-9 Championship Gambler
A-10 Chess Champion
A-11 Memory Quest
A-13 Ulysses & the Golden Fleece
A-15 Passport to London
A-16 Passport to Paris

**Home Management**

A-17 The Addresser—Mailing List
A-18 Financial Planner
A-19 General Ledger
A-20 Monthly Budgeter
A-21 Nutrition Monitor
A-22 Securities Portfolio
A-23 Recipe Box
A-24 Database Manager
A-25 Disk Library
A-26 Electronic Calendar
A-27 Electronic Phone Book
A-28 Family Tree
A-29 Personal Spreadsheet
A-30 JWriter, Word Processor
A-31 Utility Master
A-32 Vital Data Keeper
A-33 Typing Tutor
A-34 Tax Record Organizer
A-35 Checkbook Balancer
A-36 JBase

**Education Series**

A-37 Mr. Math
A-38 Speed Reading
A-39 Beginning Counting
A-40 Counting Skills
A-41 Addition I
A-42 Addition II
A-43 Addition III
A-44 Addition IV
A-45 Subtraction I
A-46 Subtraction II
A-47 Subtraction III
A-48 Multiplication I
A-49 Multiplication II
A-50 Multiplication III
A-51 Division I
A-52 Division II
A-53 Division III
A-54 Division IV

**Electric Book Co. Education Series**

A-55 Why?
A-56 When?
A-57 The Three Bears
A-58 Gingerbread Man
A-59 Baby Animals
A-60 Hoppy the Curious Kangaroo
A-61 Wild Animals
A-62 Tom Thumb
A-63 I Was a Second Grade Werewolf
A-64 Tough Eddie

## Plus these Super Accessories

- **Universal Blank Diskettes** (for Apple or Commodore) compatible with any 5¼" disk drive. Double-notched, DS/DD disks give single-sided users *twice* the storage at the same great price! Box of 5: $6.99. **Blank Diskettes:** 100% certified, DS/DD, Box of 10: $8.50.

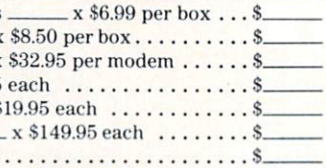
**for Commodore 64/128**

- **ShareData 300C™ 300 Baud Modem:** Autodial, autoanswer, includes terminal software: $32.95.
- **Utility Cartridge:** 30 functions: $19.95
- **Warp Drive Cartridge:** Faster loading plus more functions for more efficient use of your computer: $19.95

## ENHANCER 2000™ Disk Drive $149.95

plus $8.00 postage/handling

Commodore compatible floppy disk drive



**CALL TOLL-FREE**
CREDIT CARD ORDERS ONLY
**1-800-257-9411**
In Minnesota CALL: (612) 829-1911

VISA MasterCard

Firstline Software, Inc.
P.O. Box 5297
Hopkins, MN 55343-2297

## ORDER FORM

Please list the ordering number(s) (C-1, A-3, etc.) of the program(s) you wish to order and return this order form along with your check, money order or VISA/MasterCard information to: Firstline Software, P.O. Box 5297, Dept. A11, Hopkins, MN 55343-2297.

I'm ordering the following programs:

___ ___ ___ ___
___ ___ ___ ___

☐ Check or money order enclosed
**U.S. FUNDS ONLY**
☐ VISA ☐ MasterCard
Card # __________
Expiration Date __________
Phone ( ) __________
Name __________
Sig. __________ Date _____

Total number of software pkgs. ____ x $6.99 each ...... $____
Boxes of 5 Universal blank disks ____ x $6.99 per box ... $____
Boxes of 10 blank disks ____ x $8.50 per box .......... $____
300C 300 Baud Modem ____ x $32.95 per modem ...... $____
Utility Cartridge ____ x $19.95 each ................ $____
Warp Drive Cartridge ____ x $19.95 each ............ $____
Enhancer 2000 Disk Drive ____ x $149.95 each ........ $____
Total amount of order .......................... $____
Postage/handling (8.00 For Disk Drive; $2.00 For Software) ...... $____
MN Residents add 6% state sales tax ................ $____
**Total** (enclose check, money order or fill in VISA/MC information at left) $____
Money orders/Credit card orders shipped immediately.
Allow 4-6 weeks for delivery for check orders.

Name __________ Address __________
City __________ State _____ Zip _____

# DISCS OF DAEDALUS

## For the C-64

### By George Decker

Years of experimentation paid off for the research team made up of earth's greatest biophysicists. After repeated failures, they perfected a bio-interfaceable anti-gravity compound–a synthetic metal which, when brought into contact with living cells such as in a human hand, would float like a helium balloon.

But the team's triumph was short-lived. For warmongering Jershans, who monitored the broadcast of the scientists' press conference, kidnapped the entire team and enslaved them to work in laboratories on various planets throughout the Jershan space system, planning to exploit their genius for the purpose of weapon design. An early warning system protecting all the planets prevents any spacecraft from landing and staging a rescue attempt.

The Jershans did not count on earth's elite rescue corps using the scientists' own invention to save them. For by dropping pieces of the anti-gravity substance to the planet's surface from a safe distance above, the scientists could be enabled to float to the rescue ships–and freedom. The fragments to be used, cast by the scientists in the shape of weightlifting plates, have been codenamed the Discs of Daedalus, after the character in Greek myth who escaped imprisonment on wings of his own invention.

#### HOW TO PLAY

There are five different screens to go through. Upon completing the last screen, you start over at the first.

Screens one, three, and five get larger each time you go through them. That is, starting with the second time through these screens, you will repeat them. The third time you will go through them three times, the fourth time four, etc.

Screen four is timed for how long you stay there. Each time through this screen will increase the amount of time you will stay the following time.

All screens get a little faster each time through, and completing the last screen will award you an extra ship, up to a maximum of three.

The number of ships in reserve is displayed in the upper left of the screen. The number of scientists rescued is displayed in the upper right.

Screen One, landing sequence: Your ship will appear at the top of the screen and can be moved right or left for positioning. Below your ship are mines you want to avoid. When you push your joystick button your ship will descend. You have no control over the descent, but can move right or left to avoid the mines.

Hitting a mine results in the loss of one ship.

Screen Two, rescue sequence: An enemy ship will be on the right side of the screen and move up and down firing missiles at you. At the bottom of the screen is the scientist who will be moving back and forth. Your ship will stay in the upper half of the screen and can be moved up, down, right, or left. To rescue the scientist, push your joystick button. This will release a disc that he will need to catch to fly up to your ship. You have an unlimited amount of discs, so if you miss you can try again.

To complete this sequence, catch the scientist by touching him with your ship when he is flying up in the air.

You are responsible for all your equipment and the scientist's life. This means that if your ship, disc, or the scientist is hit by a missile, you lose a ship. You will also lose a ship if the scientist reaches the top of the screen before you catch him.

Screen Three, takeoff sequence: Remember when you descended through the mines? Now you have to go back up through them. This is just like screen one, except you are going up instead of down.

Screen Four, missiles in the space storm sequence: Missiles will fill the air and move right, toward your ship. Your ship will be on the right hand side of the screen and can move up or down to avoid the missiles. Because of the space storm, you will not always be able to see the missiles. Watch for the brief periods of light that will let you see them so you can avoid being hit. Also listen for the sounds they make, so you can judge how far they have advanced when they can't be seen.

Being hit by a missile results in the loss of one ship.

Screen Five, force field sequence: Your ship will be positioned on the right of the screen. The force field will be on the left, running top to bottom. In the force field is an opening that will constantly move up.

When you are ready to start, push the joystick button. Your ship will move to the left and won't stop until you reach the other end of the screen or hit the force field. You can control your ship by moving it up or down.

To complete this sequence, guide your ship through the force field opening. Hitting the force field results in the loss of one ship.

#### LOADING AND RUNNING

Type in LOAD "RESCUE",8,1 and hit RETURN. When the program is loaded type in SYS 49152 and hit RETURN to start. ☐

*SEE PROGRAM LISTING ON PAGE 133*

# DETONATION

## For the C-64

## By Bob Blackmer

Evil Koloccan terrorists have planted numerous bombs throughout the sacred temple of Remkcalb. They have also impregnated the temple walls with a substance connected to the detonating device, and placed vaporous swirls of energy protecting each room in the temple in which a bomb is placed. You have been selected to try to save the temple from destruction because of your knowledge of explosive devices and your athletic prowess. Time is of the essence, as the temple will be destroyed in less than eight minutes after the fuse is lit.

Your mission is to enter each room of the temple, retrieve the bombs, and take them to your containment room, where you will defuse them. This will clear one level of the temple. Do this 11 times and you will have saved the temple.

*Detonation* is an explosive, colorful arcade game for the C-64. When the title screen appears you will see the temple rooms at the top, left, and right portions of the screen, and the three vaporous swirls which will be your nemeses. The bottom of the screen is your base, the containment room where you will defuse the bombs and go to enter the next level. The fuse that will serve to make you nervous runs around the screen border. In the background you will hear the haunting rhythm which will accompany you throughout the game.

You begin the game by pressing the fire button of a joystick plugged in Port 2. You will see the fuse light and begin to burn. You are at your base at the bottom of the screen. Any contact with the walls of the rooms, the walls of your base, or the vaporous swirls will result in the burning of the fuse at a frenetic pace. You must enter each room as you avoid the swirls and retrieve the bomb. After obtaining all three bombs you must go to your containment room, where they will be defused. This will complete one level, signified by a bomb appearing at the bottom of the screen and the increased speed of the swirls. The pulsating rhythm will also speed up, providing a musical pace for your mission. Upon completion of the tenth level, the pace of the swirls and music will be sheer madness, and I wish you luck. If you are successful at this level, your score will be determined by the amount of fuse left. Needless to say, if the fuse burns out during your mission there will be a monumental explosion signifying your failure.

Your character on the screen possesses great speed and mobility, enabling you to complete your task if you are diligent in avoiding contact with the swirls. If you like to shoot for a high score, my best is 87,000. If anyone (I mean you) can top this, write me care of *Ahoy!*

*Detonation* is written in machine language and must be entered using *Flankspeed* (see page 121). After typing *Detonation* in and saving it, reset the computer and LOAD "DETONATION",8,1. Type SYS 49152 to start. □

*SEE PROGRAM LISTING ON PAGE 143*

PROF JONES
SUMMER/FALL 1986
ORDER LINE (208) 342-6939
THOROUGHBRED
GREYHOUND
TROTTER
LOTTERY/LOTTO
FOOTBALL
BASKETBALL
OFFICE HOURS
M-F 8 AM - 5 PM
SAT 9 AM - 1 PM
(Mountain Standard Time)
FREE CATALOG
1940 W. STATE
BOISE, IDAHO 83702
VISA
AMEX

**PROFESSIONAL HANDICAPPING SYSTEMS**

**Professor Picks Football™**
$99.95; with win/loss power ratings $149.95; Professional Series™ $199.95

**Expanded Lottery/Lotto Analysis**
Lottery: 3-4 digits $79.95; Lotto: max. of 99 digits $99.95; Enhanced Lottery/ Lotto $129.95

**PC-3 Portable Computer** (4k)
Choice of Thoroughbred/Greyhound/Trotter Gold Edition™ software. $249.95

**Model 100 Portable Computer** (32k)
Choice of Thoroughbred/Greyhound/Trotter Gold Edition™ software with Master Bettor™ $649.95

**PROFESSIONAL SERIES**

**PROFESSIONAL SERIES™** (Tho/Grey/Trot)
The all new Professional Series™ represents the most advanced handicapping software available.



**Analysis Module™**
Complete bet analysis highlights this basic Professional Series™ module. Full 50 tracks/kennels/etc. $249.95

**Factor Value/Multiple Regression Module™**
Factor Value Weighting highlights this addition module™ $149.95

**Data Base Manager Module™**
Automatic storage of last 11 races highlights this module. ($99.95 with Factor Value Module) $149.95



**GOLD EDITION™** (Tho/Grey/Trot)
The classic Gold Edition™ from Prof. Jones offers flexibility, results, and ease of use.

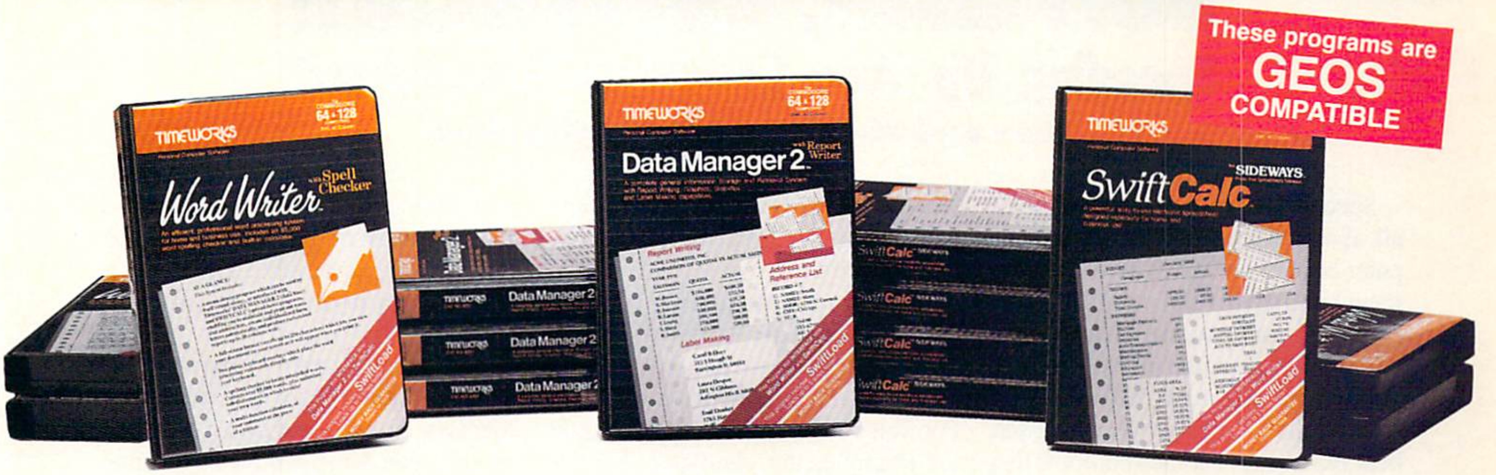
| | |
|---|---|
| Gold Edition™ | $159.95 |
| Enhanced Gold Edition™ | $199.95 |
| Limited Gold Edition™ | $299.95 |
| Ultra Edition™ | $399.95 |

**Handicapper's Bulletin Board now available**
**VHS Training Tapes now available**

**Terms:** Free shipping all software. Add $6.00 COD / $6.00 UPS Blue / $9.00 Out-of-country / ID residents add 5% / 3 weeks personal checks / cash price only add 2% Visa, MC, AMEX. Prices subject to change.

Reader Service No. 187

# IF YOU CAN FIND A BETTER C64 PROGRAM WE'LL BUY IT FOR YOU!*




## WORD WRITER with Spell Checker

- **An efficient professional word processing system for home and business use.**
- **All the features you'll need for every day word processing, plus most of the sophisticated features found in more expensive programs: document chaining, form letter printout, page separations, horizontal and vertical scrolling, and much, much more. Plus, you get:**
- **An 85,000 word Spelling Checker**
- **A built-in, 5-function calculator.**

**GEOS COMPATIBLE**
Documents from these programs can be incorporated into the GEOS environment.

**With Timeworks you get more than software. . .**

***You Get Our Customer Technical Support Team*** – free to all registered users.

## DATA MANAGER 2 with Report Writer

- **A general information storage and retrieval system with report writing, graphics, statistics, and label making capabilities. Plus, you get:**
- **Quick access to important information.** Items can be easily retrieved and printed by name, index code, date range, amount range, or any category of information stored in the system.
- **Exclusive X-SEARCH, X-SORT, and X-CHART features** that allow you to cross-search any category of information; sort items alphabetically, numerically, or by date; break down statistical information into categories; and graphically view your results.

**With Timeworks you get our Money Back Guarantee***
If you can find anything that works better for you – and it's available – we'll buy it for you. Details inside every Timeworks package.**

## SWIFTCALC with Sideways

- **A powerful, easy-to-use electronic spreadsheet designed for home and business use. Plus, you get:**
- **Sideways** – Prints all your columns on one, continuous sheet . . . sideways.
- **250 rows and 104 columns** provide more than 25,000 cells (locations) in which to place information.
- **Performs mathematical functions,** up to 12 digits. Allows the use of minimum and maximum values, averages, sums, integers, absolute values, and exponential notation.
- **Performs financial analysis functions** calculates the present and future value of a dollar and the present and future value of a constant amount (annuity).

***You Get Our Liberal Upgrade and Exchange Policy*** – Details are inside every Timeworks package.

TIMEWORKS®

***More power for your dollar***

Timeworks, Inc., 444 Lake Cook Road, Deerfield, Illinois 60015
312-948-9200

Suggested Retail List Price
Swift Calc—$39.95
Data Manager—$39.95
Word Writer—$49.95
**Available now at your favorite dealer, or call Timeworks.**

**TO ORDER CALL:
1-800-535-9497**

Reader Service No. 172

**These programs include SWIFTLOAD™ Loads up to 5 times faster!**

**These Programs INTERFACE with Each Other**

** Offer expires 90 days after date of original purchase.
*** COMMODORE 64 is a registered trademark of Commodore Electronics, Ltd.
†GEOS is a trademark of Berkeley Software, Inc.

© 1983 **Timeworks**, Inc. All Rights Reserved.

# BUFFER-IN, BUFFER-OUT:
## Speeding Up Your Computer Throughput

**Text and Photos by Morton Kevelson**

Speed! That's what computers are all about! The entire life of a computer centers around its ability to perform hundreds of thousands of rudimentary mathematical calculations per second. Even the most modest of these machines have hearts which beat a million times per second. Each beat represents another computerish thought brought to fruition.

The full speed of the computer is unleashed only when it is communing with itself. When interaction with the outside world is required, it more often than not winds up twiddling its thumbs. We humans are probably the worst offenders in this regard. We require our machines to patiently await each and every one of our keystrokes. The failure to heed just one results in the immediate censure of the hapless machine.

When it comes to sending information to the outside world, the tables are turned. In most cases we want all the speed the computer can give us. For some things, the display screen for example, the computer is more than adequate for the task. Very few humans can read text as fast as the machine can put it on the screen. However, we are dissatisfied with the time the majority of output operations take. The 1541 disk drive has received much criticism in this regard. But even more aggravating, perhaps, are printers. Even the fastest dot matrix printers barely put text on paper at a rate which makes for comfortable reading. Most of us have experienced the everlasting tedium of printing a large document or a lengthy program listing.

Fortunately, there is a purely electronic solution. Low cost computer memory chips have made it possible to assemble large blocks of computer memory at very little expense. When properly combined with a microprocessor, a suitable control program in ROM, and several support chips, a block of RAM can be set to behave like a very fast printer connected to the computer's output port. We now present two such devices which perform the desired task in fundamentally different fashions.

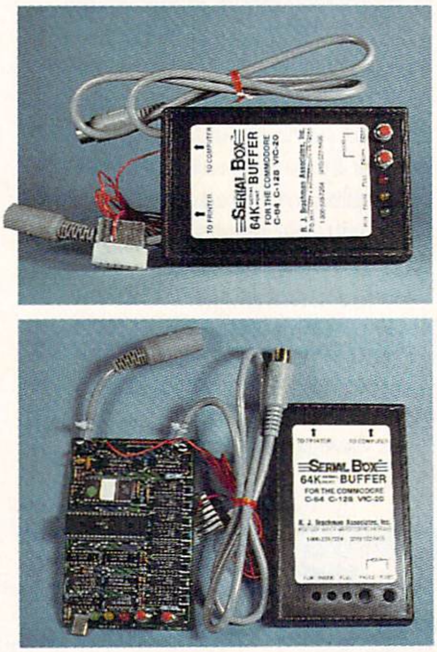
### SERIAL BOX

**R.J. Brachman Associates, Inc.**
**Commodore 64**
**Price: $79.95**

To our knowledge *Serial Box* is unique in the Commodore world. It is the only 64 kilobyte buffer which interfaces directly with the proprietary Commodore serial port. As such it may be used with any of the Commodore printers (1515, 1525, 1526, MPS series) which were designed for the VIC 20, C-64, and C-128.

However, slapping a big buffer on the Commodore serial port is not as simple as it sounds. Some thought has to be given to just how this device will be controlled. After all, Commodore serial port peripherals are expected to be "intelligent." That is, they all have microprocessing power of their own, with the ability to process instructions and take appropriate action.

R. J. Brachman has given the proper thought to the design of their product. *Serial Box* appears to the serial port as a hardware device number 6 acting as a buffer for hardware device number 4. This means that commands to *Serial Box* are issued to device number 6. In turn, *Serial Box* will automatically pass on all data and commands intended for device number 4. This arrangement will work fine with the majority of installations. However, for those rare cases, both the *Serial Box* device number and its associated buffered device number may be changed under software control to any value from 4 to 7. Of course you must make sure that *Serial Box* and its buffered device do not have the same number, or terminal confusion will result. The accompanying user manual makes these facts, among many others, perfectly clear.




**Serial Box** *sports 6502 microprocessor, 4K of operating system in ROM, and 64K of dynamic RAM. Note that an unusual software refresh of the dynamic RAM is made use of.*
*READER SERVICE NO. 140*

Note that *Serial Box* does not take the place of a printer interface. If you are using a non-Commodore printer you will still require the services of a serial port printer interface in conjunction with *Serial Box*. Of course,

# VALUE-SOFT

9513 S.W. Barbur Blvd. B-56
Portland, Oregon 97219
DEALERS WELCOME



For ORDERS only
1-800-544-SOFT
OREGON CALL, 1-503-246-0924
ADD $2.00 S & H. Visa and MC gladly.

## 'LBow™

CARTRIDGE PORT CONVERTER
CUSTOMED DESIGNED FOR
COMMODORE 64 & 128 COMPUTERS




- BUILT-IN "WARM RESET" BUTTON WILL ELIMINATE TURNING POWER OFF/ON TO RESET THE C-64 MICROPROCESSOR, THUS ADDING TO RELIABILITY.
- PARALLEL EXPANSION PORT ON L'BOW'S BACKSIDE ALLOWS SIMULTANEOUS HARDWARE & SOFTWARE ACCESS.
- VERTICAL CARTRIDGE PORT MAKES CARTRIDGE USE MUCH EASIER.
- NO MORE STRESS ON THE COMPUTER'S PRINTED CIRCUIT BOARD FROM THE PRESSURE OF PLUGGING IN CARTRIDGES SINCE 'LBOW PUTS IT ALL ON THE TABLE TOP.

## TILT & SWIVEL POWER COMMAND CENTER — $69.95

EMI FILTERING
SURGE PROTECTION
TILTS 12.5 DEGREES
SWIVELS 360 DEGREES
15 AMP CIRCUIT BREAKER
6 FOOT POWER CORD
LIGHTED PUSH BUTTON SWITCHES
MASTER POWER ON/OFF SWITCH



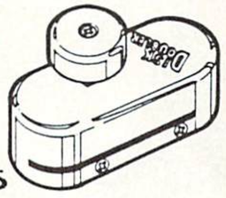
SUPER VALUE

## DISK DOUBLER®

CUTS A PRECISION SQUARE NOTCH IN THE DISKETTE AT EXACTLY THE RIGHT SPOT SO THE "FLIPSIDE" CAN BE USED.

SMOOTH, DEEP-BLUE ENAMELED FINISH IS BEAUTIFUL AND EASY TO TOUCH.

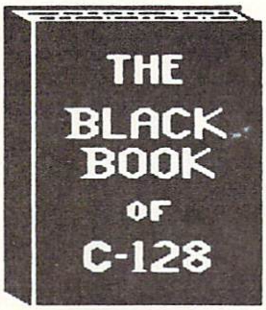
DOUBLES STORAGE SPACE OF MOST 5¼" SINGLE-SIDED DISKETTES. COMPATIBLE WITH DISK DRIVES FOR COMMODORE, ATARI, APPLE, FRANKLIN



$8.95

## PROTECTION REVEALED — $19.95

SOLVE THE PUZZLES OF SOFTWARE PROTECTION. FOR AUTHOR OR NEW USER. BECOME A MASTER OF ILLUSION. LEARN HOW TO PROTECT OR UN-PROTECT YOUR SOFTWARE. INCLUDES BASIC PROGRAM SECURITY. LEARN HOW COMPILERS, HALF TRACKS ETC, EFFECT A DISK.REVEALS MYSTICAL SECRETS OF THE C-64.BOOK IS 141 PAGES. A FREE DISK OF 21 UTILITY PROGRAMS ARE INCLUDED. THE BOOK IS WRITTEN AT A LEVEL A BEGINNER CAN UNDERSTAND.




## REFERENCE BOOK

OVER 75 EASY TO READ CHARTS AND TABLES
261 PAGES OF SOLID INFORMATION
NOT ONE WASTED PAGE
LAYS FLAT FOR EASY READING
COLOR CODED, ALWAYS FIND WHAT YOU NEED

WE ARE SO CERTAIN YOU WILL LIKE THE BLACK BOOK OF C-128, THAT WE MAKE THIS UNUSUAL OFFER, IF YOU DON'T FEEL THAT IT CONTAINS MORE INFORMATION THAN ANY OTHER REFERENCE BOOK FOR THE C-128, SEND IT BACK IN GOOD CONDITION WITHIN 10 DAYS. WE WILL REFUND THE PURCHASE PRICE WITH A SMILE

$15.95

## 128 CABLE — $12.95

80 COLUMN ON THE C128 WITH THE 1701/1702 MONITOR MONOCHROME WITH SOUND. SAVE BIG DOLLARS.

## BRAND X — $19.95

BRAND X IS A DISK CATALOGER.4,000 ENTRIES OR 100 DISKS. ADD, SAVE, ETC.. IDENTIFIES 14 FILE TYPES PRINTS LISTS IN ONE, TWO, OR THREE COLUMNS, PLUS LABELS. END DISK CONFUSION WITH BRAND X 64.

## VIDEO LOG — $19.95

VIDEO LOG C64 CATALOGS THE MOVIES YOU HAVE SAVED ON VIDEO TAPE. ENTER 1,000 FILMS, OR 250 TAPES!! PRINTS A CATALOG OF TITLES, OR LABELS FOR TAPES. LIST BY TAPE NUMBERS, OR FILM NAME. INFORMATION SAVED: TITLE, START/END, LENGTH, PLUS CATEGORY.

## CABLES & ETC.

| | | |
|---|---|---|
| 9 FT 6 PINDIN MALE BOTH ENDS | # B69 | $8.95 |
| 18 FT 6 PINDIN MALE BOTH ENDS | # C618 | $16.95 |
| 6 FT 6 PINDIN MALE/FEMALE | # A66 | $6.95 |
| MONITOR, 5 PINDIN TO 4 RCA PLUGS | # D56 | $9.95 |
| 6 FT. MONITOR EXTENSION, 5 PINDIN | # E56 | $6.95 |
| 6 FT MONITOR EXTENSION, 8 PINDIN | # X618 | $6.95 |
| 6 FT CENTRONICS, MALE/MALE | # FC36 | $14.95 |
| 6 FT RS-232, 25 PIN MALE/MALE | # G625 | $14.95 |
| 9 FT 6 PINDIN MALE RIGHT ANGLE/MALE | # R69 | $9.95 |
| 6 PIECE JEWELERS SCREW DRIVER SET AND CASE | | $6.95 |
| WRITE PROTECT TABS, QUANITY 100 | # TAB | $1.49 |
| DISK SLEEVES, WHITE, QUANITY 100 | # DS100 | $7.95 |

## PARALLEL A/B SWITCH

36 PINS SWITCHED, FEMALE CONNECTORS, GOLD CONTACTS, HIGH QUALITY PUSH BUTTON SWITCH — $44.95

## RS 232 A/B SWITCH

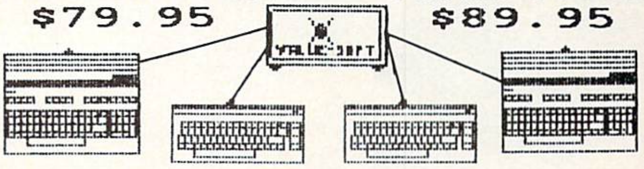
25 PINS SWITCHED, DB 25 CONNECTORS, HIGH QUALITY PUSH BUTTON SWITCH — $44.95

## SUPER SWITCH

FOR SCHOOL OR BUSINESS

4 COMPUTERS TO 1 DEVICE — $79.95

6 COMPUTERS TO 1 DEVICE — $89.95

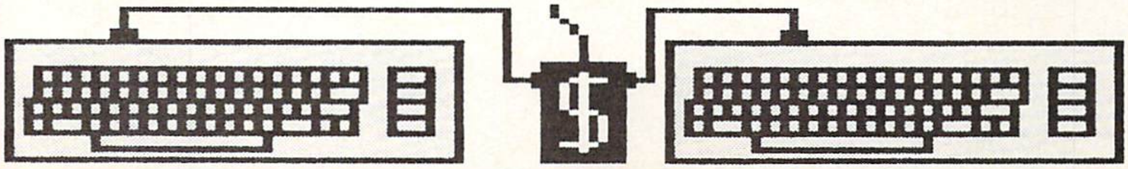



## $ - SAVER SWITCH — $29.95

THE $ SAVER SWITCH CONNECTS TWO COMPUTERS TO ONE PRINTER OR DISK DRIVE. BETTER YET, SHARE YOUR DRIVE AND PRINTER BETWEEN TWO COMPUTERS, LINK 2 PRINTERS TO ONE COMPUTER. FLIP A SWITCH FROM ONE DEVICE TO ANOTHER. NO ALTERATIONS OR EXTRAS NEEDED, PLUGS IN IN SECONDS.

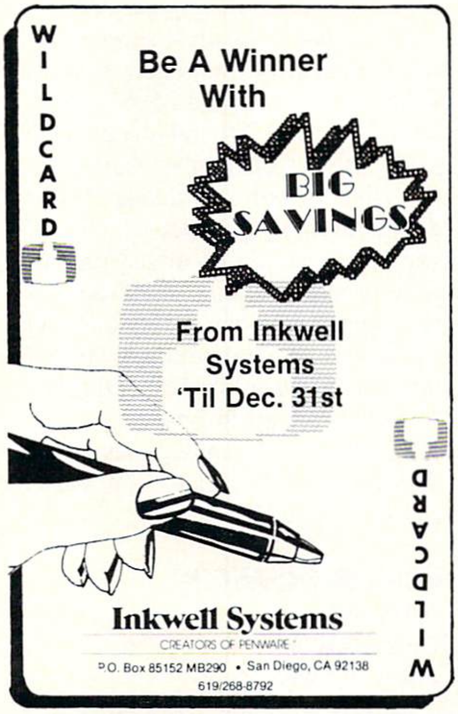
MODEL 1...COMES WITH TWO 6 PINDIN FEMALE SOCKETS AND ONE 4 FT. 6 PINDIN MALE CABLE

MODEL 2....COMES WITH THREE 6 PINDIN FEMALE SOCKETS. CAN BE USED WITH MOST PRINTER INTERFACES



NEW METAL BOX


Build Your Own Robotics with the Robotic Workshop
For Ages 10 years old and up.
$149.95 List Price (C64/128)
Coming for Apple, Atari, and IBM.
ROBOTIC WORKSHOP
MB220
Multivolt
For use with your home computer.
The Robotic Workshop is the ultimate high-tech construction set. Discover how easy it is to build hundreds of Robotic Projects and control them with your home computer.
Simple and easy to use
(For the Beginner)
• Parts just snap together
• No knowledge of programming needed
• 50 Tutorial projects
• Over 50 components (2 motors, gears, wheels, sensors, etc.)
• Electronic control unit
• Full instruction manual
• Joystick or keyboard control
• Teaches principles of science/engineering
• Includes CAPSELA® motorized parts
Advanced Features
(For the Programmer/Hobbiest)
• Speed/direction control of 3 motors at once
• Robotic Operating Software (R.O.S.)
• 25 additional 'BASIC' commands
• Programming instructions
• Advanced commands and techniques
• Precise timing, counting and switching
• Digital Voltmeter
• Digital Oscilloscope
• Digital Speech Storage
• Technical information
• Add on modules and parts (purchased separately)
For more information call 1-800-824-2549
ACCESS™
Software Incorporated
#A 2561 South 1560 West, Woods Cross, Utah 84087




the connection order requires that *Serial Box* goes between the computer and the printer interface.

The *Serial Box* hardware is contained in an unimposing 3-1/2 by 5-3/5" black box not much different in external appearance from most printer interfaces. Communication with *Serial Box* is via a pair of unshielded cables which are terminated in male and female six-pin DIN connectors compatible with the Commodore serial bus. Thus *Serial Box* becomes another link in the serial port daisy chain. Of course it should be the last link right ahead of the printer or its associated interface.

Power for *Serial Box* is supplied over a single red wire terminated in a cassette port connector. This may be fine for use with the VIC 20 or the C-64, but it will cause problems for SX-64 and Plus/4 users. (See next month's *Ahoy!* for information on building a 5v power supply.)

The front panel of the serial box also sports a trio of colored light emitting diodes (LEDs) in red, yellow, and green, along with a pair of red push-buttons. The green light signifies that all is well with *Serial Box*. The yellow light indicates that pause mode is in effect. The red light signals that the buffer is full, sort of a case of *Serial Box* indigestion. One of the push-buttons serves to place *Serial Box* into pause mode while the other serves to reset the built-in line counter. Simultaneously pressing both buttons will clear all data stored in the buffer.

The LEDs will also light in various combinations to indicate the possible operating conditions. For example, all three lights lit at once indicates that the buffer has filled while the printer is off-line. This may be considered as a case of terminal indigestion with no place to go.

Operating *Serial Box* is simplicity itself. Just plug it in, turn everything on, and away you go. There are several other features of which you will




most likely wish to avail yourself. The pause button takes primary consideration. This stops output to the printer while still accepting data from the computer. The primary advantage of this mode is a slight increase in speed. During normal operation the buffer sends one character to the printer for every eight received from the computer. When in pause mode *Serial Box* turns its full attention to the computer, resulting in a slight increase in speed. Note that pausing *Serial Box* does not suspend the printing of any data which may already be in the printer or interface buffers.

The actual operating speed of *Serial Box* is dependent to a great extent on the capabilities of the software running on the computer. In general, word processors will be able to make the most of *Serial Box*, as these programs can generally transmit text as fast as the printer can take. Graphic dumps will give variable results, as they are usually calculation-intensive. The actual benefit you will perceive will of course depend on the speed of your printer. The slower your printer, the more you will gain.

R. J. Brachman claims a top speed for *Serial Box* of 677 characters per second (cps). We clocked the device at about 450 cps while dumping an 18K text file from *Easy Script* with *Serial Box* in pause mode. The speed of normal operation will also depend to some extent on the printer or printer interface used in conjunction with *Serial Box*. Throughput while driving a Cardco Super-G and a Gemini 10X was about 250 cps. A large buffer in the associated interface does not guarantee additional speed. Running with a Xetec *Super Graphix*, with an 8K built-in buffer, resulted in only a 6% speed increase. However, an MW-350 with a 10K buffer generated nearly a 40% speed improvement over the Cardco combination. Note that the printer interface will have no effect on speed when *Serial Box* is



Reader Service No. 168

# KINDER KONCEPTS

30 ACTION-PACKED PROGRAMS FOR PRE-SCHOOL TO REMEDIAL SECOND GRADE

GLOWING REVIEWS FROM *SPECIAL EDUCATION SOFTWARE REVIEW, SOFTWARE REPORTS,* AND *ELECTRONIC LEARNING.*

FOR APPLE II FAMILY, PET, AND COMMODORE 64/128

COMPLETE SET (30 PROGRAMS) – $99.00 PLUS $2.00 SHIPPING
READING DISK ONLY (15 PROGRAMS) – $55.00 PLUS $2.00 SHIPPING
MATH DISK ONLY (15 PROGRAMS) – $55.00 PLUS $2.00 SHIPPING

FREE TRIAL IN YOUR SCHOOL FOR 30 DAYS

CALL TODAY !
TOLL FREE 1-800-422-0095
MICHIGAN AND AFTER 5:00PM
(313) 477-0897
VISA /MASTERCARD
MIDWEST SOFTWARE
BOX 214, FARMINGTON, MI 48024

# NEW TESTAMENT CONCORDANCE

(KINGS JAMES VERSION)

- LOCATE VERSE REFERENCES FOR ANY NEW TESTAMENT WORD
- ALL MACHINE LANGUAGE FOR SPEED
- STORE VERSE LIST ON DISK FOR LATER USE OR SEND TO YOUR PRINTER
- MULTIPLE WORD SEARCHES
- UP TO 99 CONTEXT VERSES MAY BE SPECIFIED
- IDEAL FOR SERIOUS BIBLE STUDENTS EVERYWHERE

FOR COMMODORE 64/128 OR APPLE II E, II C

ONLY $49.50
PLUS $2.00 SHIPPING

ORDER LINE 9AM TO 5PM
1-800-422-0095
MICHIGAN AND AFTER 5 PM
(313) 477-0897
MIDWEST SOFTWARE
BOX 214, FARMINGTON, MI 48024

Reader Service No. 161


in pause mode. In this case *Serial Box* always runs at its maximum possible speed.

Do not confuse the *Serial Box* throughput speed we have just discussed with the operating speed of the printer interface while emulating a Commodore 1525 printer. These speeds are entirely independent of each other. The former refers to the rate at which data is taken from the computer. The latter indicates the rate at which the interface drives the printer graphics mode. Refer to the various printer interface reports which have appeared in *Ahoy!* for additional details.

Most Commodore printers and printer interfaces will work just fine with *Serial Box.* However, the manual does list several products which use "non-standard" serial port timing. Interestingly enough, one of these products is the Commodore DPS-1101 printer. The problem lies in the incomplete specification of the serial bus timing which has been published by Commodore. To avoid these problems, *Serial Box* has a built-in mode that slows it down slightly for use with particular peripherals. However, this operating mode has no effect on *Serial Box's* speed when it is in pause mode.

*Serial Box* will not solve all printer speed problems. In some cases the printing speed is totally dependent on the driving software. The best example that comes to mind is the highly popular *Print Shop* from Broderbund. This program spends an inordinate amount of time "thinking" about what it's going to print. As a result there is virtually no benefit to be obtained from *Serial Box* for this application.

To make life easier for the Commodore user, *Serial Box* recognizes several software operating commands. Among these is the ability to keep count of the number of lines printed and to skip the paper perforatioins at appropriate intervals. The remainder of the commands allow you to duplicate the *Serial Box* hardware functions under software control, change its associated device numbers, and adjust the line counter and perforation skip parameters.

*Serial Box* is an ideal supplement to the standard Commodore printers (1515, 1525, 1526, and MPS series). These printers are relatively slow with little or no built-in buffering. Actually, to our knowledge, *Serial Box* is the only product which will offer some relief with these Commodore printers. Of course, *Serial Box* will benefit all letter quality or NLQ dot matrix printer operations. Pricewise, at $1.25 per kilobyte, *Serial Box* is certainly hard to beat.

R.J. Brachman Associates, Inc., P.O. Box 1077, Havertown, PA 19083 (phone: 215-622-5495).

### PRINTER ENHANCER

**Xetec, Inc.**
**Commodore 64**
**Price: $249.95**

Strictly speaking, the *Printer Enhancer* is not a Commodore-specific peripheral. However, Xetec has been a supplier of Commodore printer interfaces for some time now. In fact, if you have been using their *Super Graphix* printer interface, you will recognize the fonts which the *Printer Enhancer* generates.

The *Printer Enhancer* is designed to work directly with the Centronics type of parallel printer hookup. It is equipped with a single Centronics input port and a pair of shielded output cables, terminated with Centronics connectors which are suitable for most popular printers.

In addition to 64K of built-in buffering, the *Printer Enhancer* also has eight near-letter quality (NLQ) built-in fonts when used with a compatible dot matrix printer. The font samples presented here were produced with the *Printer Enhancer* and a Star Micronics Gemini 10X printer.

Typewriter Font
*Italic Font*
Script Font
**News Font**
**Manhattan Font**
Shadow Font
**Block Font**
Tech Font

Setup of the *Printer Enhancer* is simple. Just plug the "A" cable from

the *Enhancer* into your Centronics printer. The Centronics cable from your existing interface connects directly to the *Enhancer.* If you are using a second Centronics printer, just hook it up to the *Enhancer's* "B" cable. Power for the *Enhancer* is obtained from a self-contained "battery eliminator" style plug-in wall transformer. Thus it will place no additional burden on your Commodore's power supply.

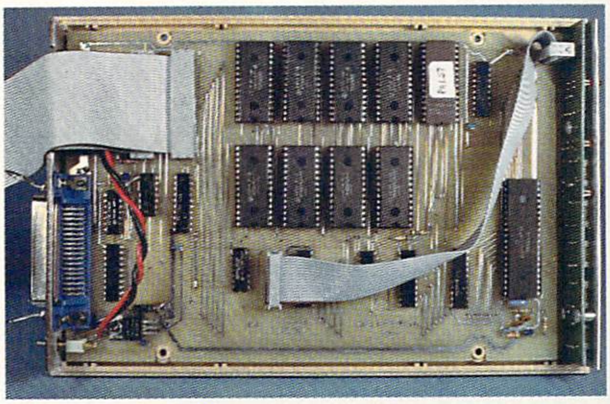
Note that a second Commodore style printer interface, or any type of printer switch, is not required for the second printer. All printer switching is handled electronically by the *Printer Enhancer.* If both printers are of the same or compatible types, the emulation features of your Commodore interface will be available with each one.

The *Printer Enhancer* setup is completed by setting the eight DIP switches located on its back panel (four for each printer). A built-in power up self-test feature lets you verify the settings of the DIP switches, as well as checking the *Printer Enhancer's* operation and RAM. Operation of the five front panel push-buttons may also be verified at this time. Pushing each one should generate a confirming message on your printer. Finally, all 10 of the front panel's LEDs light in a sequential "sweep" pattern to verify their operation.

The five front panel push-buttons give direct access to all of the *Printer Enhancer's* features. Two of these are the mandatory buttons for pausing operation and clearing the buffer. A third button lets you set the number of copies of the buffer contents to be printed. Up to 255 copies are possible. Note that the entire document will have to fit in the 64K buffer for this feature to work. A fourth button lets you select either or both printers. Judicious use of these buttons allows for several documents to be sent to the buffer and selectively routed to either printer. Of course, the total length of all documents must not exceed 64K.

The fifth button cycles the *Enhancer* through its eight built-in NLQ fonts. These fonts are generated using your dot matrix printer's high density dot graphics capabilities. They will not be available on printers which lack the requisite dot density. Supported printers are Epson, Star Micronics, Prowriter, C Itoh, and Blue Chip. All printers have settings for both narrow and wide carriage versions. Other ASCII printers may also be used without the benefit of the built-in fonts.

Since the fonts are generated internal to the *Enhancer,* the printer's built-in text features are not directly available. Several of these features have been incorporated into the *Printer Enhancer's* fonts. These include



***Inside the* Printer Enhancer *we find a 6805 8-bit microprocessor, 64K of static RAM, and 32K of ROM. This prototype lacks twin shielded cables. READER SERVICE NO. 141***




**Printer Enhancer's *front panel displays no lack of buttons and lights.***



Reader Service No. 142




expanded and compressed print, boldface, and underlining. The exact features will vary with the specific printer. To maintain compatibility with your existing driver software, the *Printer Enhancer's* control codes which select these features are identical to the codes on your printer.

Some of the printer features are also available from the *Printer Enhancer's* front panel by pressing the push-buttons in predefined combinations. The array of 10 LEDs function as indicators of the selected features by blinking in a prearranged pattern. In this case, it is the timing of the various flashes which conveys the information. Overall the scheme worked, although it was difficult to follow the blinking patterns. On the other hand, an easier to use arrangement would have more than doubled the total number of indicating lights and front panel switches.

The front panel feature selection was not designed to implement changes within the body of the text. These switches should be used for global settings for an entire document. Fine control of the text should be done using the traditional ESCape code sequences.

Operating speed of the *Printer Enhancer* is dependent on your installation. If the *Printer Enhancer* is installed after a Commodore-type printer interface, speed will be determined entirely by the characteristics of the interface. This will be on the order of 300 to 600 cps. Additional speed limitations may be imposed by your driving software, as was pointed out in the review of *Serial Box* above.

The greatest data transfer speed to the *Printer Enhancer* will be obtained with a direct parallel connection between the computer's user port and the *Printer Enhancer.* We achieved a data transmission rate greater than 1400 cps when using *Superscript 128* with the *Printer Enhancer* connected to the user port. The disadvantage of the user port connection is that the computer's operating system does not recognize this as a valid eight bit parallel port. This means that BASIC program listings or output cannot readily be sent to your printer. Soft-

### USER PORT-TO-CENTRONICS CABLE

#### PARTS LIST

| Item | Stock # | Price |
|---|---|---|
| 36 Pin Centronics connector (solder type) | 276-1534 | $4.99 |
| 5' ribbon cable | 278-772 | $3.59 |

A 24-pin edge card connector (.156" x .200" spacing) is available for $2.90 (Part No. CI-12) from Digi-Key, 701 Brooks Ave. South, Thief River Falls, MN 56701 (phone: 1-800-344-4539).

#### CONNECTION TABLE

| User Port Pin | User Port Type | | Centronics Pin | Centronics Type |
|---|---|---|---|---|
| A | Ground | ⇔ | 33 | Ground |
| B | Flag2 | ⇔ | 10 | Acknowledge |
| C | PB0 | ⇔ | 2 | Data 1 |
| D | PB1 | ⇔ | 3 | Data 2 |
| E | PB2 | ⇔ | 4 | Data 3 |
| F | PB3 | ⇔ | 5 | Data 4 |
| H | PB4 | ⇔ | 6 | Data 5 |
| J | PB5 | ⇔ | 7 | Data 6 |
| K | PB6 | ⇔ | 8 | Data 7 |
| L | PB7 | ⇔ | 9 | Data 8 |
| M | PA2 | ⇔ | 1 | Data Strobe |
| N | Ground | ⇔ | 16 | Ground |

ware drivers are available which will do the job. Of course these must be LOADed up and initialized before running your application. This is generally not possible with most commercial software.

Fortunately, many commercial programs contain the necessary routines to redirect output to a Centronics printer on the user port. Word processors in particular support this operating mode. *Vizawrite Classic* for the C-128 (Solid State Software) even offers an optional cable for this very purpose. Suitable cables may also be available from your Commodore dealer.

If you have the technical ability, a cable may be easily constructed from readily available parts. The table gives the Radio Shack parts list and the necessary connections for building your own user port-to-Centronics cable for the C-64 and C-128.

User port connections are as per the *Commodore 64 User's Guide* (page 143), or the *C-128 System Guide* (page 352). Note that the view shown in these books is looking at the computer from the back. If you do opt for the user port connection you should arrange for an easy means of reconnecting your printer to the serial port. This will allow the printer to be used with those programs that do not support the user port. It will also permit printer operation along with the modem.

At first glance the *Printer Enhancer* may seem like an expensive proposition for just a 64K buffer. However, if you are running two printers with your computer, the cost does not seem that extreme. In this case the overall price must include the cost of two printer interfaces and a serial port switch, or one printer interface and a Centronics A-B switch. The latter are typically $70. When you're done you will still lack the custom fonts and the built-in software selection of the printer as provided by the *Printer Enhancer.* Also keep in mind that nothing is as fast as a Centronics buffer connected directly to the user port.

Xetec, Inc., 3010 Arnold Road, Salina, KS 67401 (phone: 913-827-0685).

## PARTNER 128

**Timeworks, Inc.**
**Commodore 128**
**Cartridge; $69.95**

The Commodore equivalent of IBM PC RAM-resident programs like Borland's *Sidekick, Partner 128* enhances the 128's overall capabilities, making it an even better small business machine. Like its forebears, this application provides a number of useful (though unrelated) tools designed to increase personal productivity.

**8, 7, 6, 5...**

With the appointment calendar you can keep reminders, lists of things to do, people to see, and places to be. There's only one drawback: space for these categories is limited to five entries per day. Even bag ladies have more than five things to do in a day!

The memo pad is a mini-word processor with decent edit capabilities, flexible cursor control, and word wrap. Two nice touches are a BASIC search function (case insensitive) and typewriter emulation. The latter al-

C.O.M.B.
Authorized Liquidator




COMMODORE®
VICMODEM™

- Use with the Commodore® C64™, the SX-64 or the VIC-20 Computer.
- Bell 103 Compatible.
- Full Duplex; 300 Baud.
- Manual Dial Direct Connecting.
- FCC Registered.

This Modem is LOW liquidation priced because it was closed out by Commodore®. Add it to your computer for access to timely financial information, news and reference libraries...as near as your phone! An affordable introduction to phone/computer services; and you can communicate with computer users who also own modems!

Use with data cassette (included), or with terminal program software, available at computer stores.

90-Day Limited Factory Warranty.

Mfr. List Price ...... $59.00

Liquidation Priced At Only ..... $19

Item H-1698-7041-072
Shipping, handling: $4.00 each

Commodore is a registered trademark of Commodore Electronics, Ltd.

Credit card customers can order by phone, 24 hours a day, 7 days a week. VISA MasterCard AMERICAN EXPRESS

Toll-Free: 1-800-328-0609

Sales outside the 48 contiguous states are subject to special conditions. Please call or write to inquire.

SEND TO: Item H-1698
C.O.M.B. Direct Marketing Corp.
1405 Xenium Lane No./Minneapolis, MN 55441-4494

Send___Modem(s) Item H-1698-7041-072 at $19 each plus $4 each for shipping, handling. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)

☐ My check or money order is enclosed. (No delays in processing orders paid by Check.)

Charge: ☐ VISA® ☐ MasterCard® ☐ American Express®

Acct. No.________ Exp.___/___

PLEASE PRINT CLEARLY

Name ________

Address ________

City ________

State ________ ZIP ________

Phone (___) ________

Sign Here ________

COMB COMB COMB

# READER SERVICE INDEX


| Page | Company | Svc. No. |
|---|---|---|
| 22 | Abacus Software | 190 |
| 34 | Abacus Software | 189 |
| 81 | Abby's Discount Software | 157 |
| 60 | Access Software Inc. | 169 |
| C-4 | Access Software Inc. | 166 |
| 11 | Accolade Entertainment Software | 195 |
| 47 | Accolade Entertainment Software | 136 |
| 79 | Alsoft | 156 |
| 71 | American International Computer | 183 |
| 42 | Avalon Hill | 135 |
| 67 | Batteries Included | – |
| 16,17 | Berkeley Softworks | 147 |
| 18,19 | Berkeley Softworks | 148 |
| 23 | Briwall | 175 |
| 47 | Central Point Software | 137 |
| 8 | Cheatsheet Products Inc. | 194 |
| 12 | Cheatsheet Products Inc. | – |
| 40 | Chipmunk Software | 151 |
| 11,13 | Comal Users Group USA | – |
| 65 | C.O.M.B. Direct Mktg. Corp. | – |
| 73 | C.O.M.B. Direct Mktg. Corp. | – |
| C-2 | CompuServe | 144 |
| 31 | Computer Centers of America | 181 |
| 38 | CSM Software, Inc. | 150 |
| 24 | CVC Online | 176 |
| 15 | Data East USA, Inc. | 179 |
| 48 | Electronic Arts | 138 |
| 36 | Electronic One | 188 |
| 97 | Emerald Components Int'l | 164 |
| 42 | Epyx, Inc. | 134 |
| 48 | Firebird | 139 |
| 54 | Firstline Software, Inc. | 155 |
| 85 | Floppy House Software | 159 |
| 14 | Free Spirit Software | 200 |
| 46 | GSR Software Company | 162 |
| 116 | HesWare | 202 |
| 37 | Hi Tech Expressions | 182 |
| 45 | Hi Tech Expressions | 149 |
| 13 | Howard W. Sams & Co. | 197 |
| 77 | Illustrated Images | 198 |
| 61 | Inkwell Systems | 168 |
| 70 | Jason-Ranheim | 205 |
| 6 | Ketek | 146 |
| 92 | KFS Software, Inc. | 170 |
| 82,83 | Lyco Computer | 158 |
| 49 | Maxtron | 165 |
| 29 | MicroComputer Services | 191 |
| 4,5 | MicroProse Simulation Software | 145 |
| 12 | MicroProse Simulation Software | 196 |
| 44 | MicroProse Simulation Software | 152 |
| 72 | Micro-Tek | – |
| 91 | Micro-W Distributing, Inc. | 163 |
| 62 | Midwest Software | 161 |
| 94 | Ohio Computer Services, Inc. | 185 |
| 53 | Origin Systems | 154 |
| 63 | Prism Software | 142 |
| 56 | Professional Handicapping | 187 |
| 50,51 | Pro-Tech-Tronics | 153 |
| 98-115 | Protecto Enterprizes | 116 |
| 41 | Quantum Computer Services | 133 |
| 26 | R.J. Brachman Associates, Inc. | 177 |
| 58 | R.J. Brachman Associates, Inc. | 140 |
| 30 | Schnedler Systems | – |
| 9 | Skyles Electric Works | 171 |
| 25 | Software Discounters of America | 180 |
| 39 | Solid State Software | 160 |
| 117 | Solutions Unlimited | 178 |
| 10 | Superior Micro Systems, Inc. | 192 |
| 69 | T.C. Electronics | 204 |
| 18 | TPUG Inc. | – |
| 57 | Timeworks | 172 |
| 66 | Timeworks | 193 |
| C-3 | Timeworks | 167 |
| 52 | Ultrabyte | 174 |
| 14 | Unlimited Software | 203 |
| 59 | Value-Soft | 173 |
| 64 | VG Data Shack | 184 |
| 32,33 | White House Computer | 186 |
| 69 | Wilanta Arts | 201 |
| 62 | Xetec, Inc. | 141 |
| 68 | Xetec, Inc. | 199 |
| 10 | *Ahoy!* Binders | – |
| 68 | *Ahoy!* Disk Magazine | – |
| 75 | *Ahoy!* Back Issues | – |
| 76 | *Ahoy!* Subscription | – |
| 87 | *Ahoy!* Access Club | – |
| 88 | *Ahoy!*/PlayNET Offer | – |
| 93 | *Ahoy!* Disk | – |


The publisher cannot assume responsibility for errors in the above listing.

# REVIEWS

lows direct line-by-line output to a printer for labels, envelopes, forms, and other items which are traditionally difficult to do by computer. (Timeworks suggests the memo pad be used to write online help text. A great idea, if you're in the market.)

Unlike the free form nature of the 60-column memo pad, the address list locks users into a format of name, address, city, state, zip, and phone number. You must live not only with these field sizes, but also with the inadequacy of one address line.

Somewhat offsetting this rigid approach is the routine's sort feature, an intuitive, alphanumeric function which takes its cue from the field where the cursor is positioned. Now that's convenience. An auto dialer, supported by the database, is included for modem madness. Other peripheral, but more generally useful resources include the five function calculator with hardcopy capability and an




*128 answer to* Sidekick *for IBM PC.*
*READER SERVICE NO. 193*

interface to DOS. Though restricted to commands such as new, verify, initialize, rename, and scratch, such easy access is a boon under certain circumstances.

The ability to dump screen imag-

**BUT HOW GOOD A PARTNER IS IT?**

By now you are wondering if *Partner 128* works with your favorite (or eagerly anticipated) software. Since we don't want you to risk hard earned cash finding out, here's the compatibility lowdown.

Programs in which *P 128* ran with no problems whatsoever:

*Fasthack'em* (Basement Boys)
*Jane* (Commodore)
*Brainstorm* (Country Road Software)
*dfile & wordfile 128* (michaelsoft)
*Superbase* (Precision)
*Personal Accountant* (Softsync)
*Data Manager 128* (Timeworks)
*Sylvia Porter's Personal Finance* (Timeworks)
*Word Writer 128* (Timeworks)

Programs which did not allow disk access until after <Commodore O>, the override command, was issued (beware – this command may damage data files):

*Superscript* (Precision)
*Pocket Writer* (<Commodore G> to make menus legible). (Digital)
*Pocket Planner* (<Commodore G> to make menus legible. Also, *P 128* does not work when displaying graphs). (Digital)

Programs which refused to access the disk drive, even after <Commodore O> was issued:

*Fleet System 3* (Professional)
*Swiftsheet* (Cosmi)
*Swiftcalc* with *Sideways* (N.G. in graphics mode too). (Timeworks)

Not easily classified:

*Multiplan* (Epyx): SwiftLoad function of *P 128* interfered with loading. After <Commodore D> disabled SwiftLoad, *Multiplan* worked fine.

*PaperClip* (Batteries Included): *Partner 128* goes in Port 1, security key in 2, <Commodore O> corrects "No Disk Access" problem.

*New Consultant* (Batteries Included): *P 128* in Port 1, security key in 2, no problems after that.

*Bobs Term 128* (Precision): *P 128* in joyport 1, security key in 2, <Commodore G> to make menus legible. All *P 128* functions worked fine.

*Note:* <CTRL (P128 BUTTON)> is correct procedure to call *P-128* in Port 1.

While this is not a complete list of 128 applications, it is representative of titles from some of the best-known software houses. (*Vizawrite* is not a *P 128* partner, since they both occupy the cartridge port. Slot extenders may help here, though there are no guarantees.)

NEW!
• PAPERCLIP II for COMMODORE 128
• PAPERCLIP for APPLE II/E/C
• SPELLPACK for ATARI 130XE
Coming Soon
PAPERCLIP ELITE

# THE Premier Word Processing Package – CREATIVE COMPUTING

"PaperClip is easy to use, yet offers the advanced features of programs designed for the IBM PC. These include: block move, copy, delete, macros, automatic page numbering, headers, footers, underlining, boldface, super and subscripts, variable character pitch, and custom character sets. The editing screen can be set up to 130 columns wide, & text can be scrolled in any direction. A preview mode displays formatted text exactly as it will appear on the printed page. You may further define your own formatting parameters, including margins, line lengths, page length and spacing.

PaperClip contains over 30 printer files for all the current major models. The documentation is excellent and the disk itself unprotected, though keyed through a joystick port. This means you can make as many back-up copies as you like, but can use the program only when the key is inserted."–CREATIVE COMPUTING

*"PaperClip is one of the easiest of the professional word processors to use, with a sensible manual and plenty of aids for the accident-prone."* COMPUTING NOW

*"a "must have" in an ideal software-library"* ELECTRONIC LEARNING

*"PaperClip is the Cadillac of word processors"*–OMNI

*"an excellent full-featured word processor"*–THE BOOK OF CO

*"So clearly superior, …State-of-the-art word processing"*–ANTIC *"…mos*

*"the ultimate word processor…"*–ANALOG

*"…best professional word processor available"* RUN

*"exceptional word processing"*–INPUT *"hard to beat"* ACE

*"You'll find yourself growing spoiled."*–FAMILY COMPUTING

*"A superb word processor,…the most sophisticated to date!"*

*"…does exactly what it was intended to do…and more"*

*"…most powerful of packages"*- COMMODORE MAGAZINE

*"…facts attest to its excellence!"*–FAMILY COMPUTING

NEW!
PAPERCLIP II
for your C128!
Takes full advantage of the C128's increased speed and power!
• Faster program loading!
• Easier text handling!
• Advanced new features!
• Built in telecommunications! auto dial from menu supports 300 to 2400 baud and faster!
• Built in Spelling checker with more than 30,000 words! PLUS a personal dictionary for thousands more • Word wrap
• And much much more!

*You will not find a word processing package superior to this one!*
CREATIVE COMPUTING

# PaperClip

## "The #1 Best Selling Word Processing Package"*

–BILLBOARD'S COMPUTER SOFTWARE CHARTS!

Available for Commodore 64, Pet, all Atari home computers, and new enhanced 128K versions for Apple II/e/c, Atari 130XE and Commodore 128. **COMING SOON:** Paperclip Elite for IBM MS DOS, Amiga and Atari ST.

BATTERIES INCLUDED

30 Mural Street
Richmond Hill, Ontario
L4B 1B5 Canada
(416) 881-9941
Telex: 06-986-266

"The Energized Software Company!"

**WRITE TO US FOR FULL COLOR CATALOG** of our products for Commodore, Atari, Macintosh, Apple and IBM systems.

17875 Sky Park North,
Suite P, Irvine, California
USA 92714
(416) 881-9816
Telex: 509-139

FOR TECHNICAL SUPPORT OR PRODUCT INFORMATION PLEASE PHONE (416) 881-9816. © 1986 BATTERIES INCLUDED. MACINTOSH APPLE, ATARI, COMMODORE AND IBM ARE REGISTERED TRADEMARKS RESPECTIVELY OF APPLE COMPUTERS INC., ATARI INC., COMMODORE BUSINESS MACHINES INC., AND IBM BUSINESS MACHINES INC. *AS COMPILED FROM NATIONAL RETAIL STORE SALES REPORTS FOR WEEK ENDING JANUARY 5, 1985. IF YOU CAN'T FIND PAPERCLIP AT YOUR FAVOURITE SOFTWARE OUTLET YOU CAN ORDER DIRECT FROM US AT THE FULL SUGGESTED LIST PRICE (PLUS $5.00 FOR POSTAGE AND SHIPPING) BY CALLING 1-800-387-5707. ATARI & APPLE PAPERCLIP $59.95. PAPERCLIP II FOR THE C128 $79.95. ALL PRICES SHOWN ARE IN U.S. DOLLARS.

TO UPGRADE YOUR "PAPERCLIP FOR THE C128" TO PAPERCLIP II SEND US YOUR ORIGINAL DISK, KEY AND $35.00, AND WE'LL SEND YOU A COMPLETE NEW PACKAGE!

es to a printer is good for programming and manual preparation. Unfortunately, it can only handle text; graphics are out of the question.

A security option entitled Swift-Lock makes it easy to leave an unattended 128 while preventing unauthorized tampering with files. As this can be circumvented by a warm reboot, it doesn't provide much protection against determined snoopers. Of course, it will deter the uninitiated or those without sufficient time to reboot and reload the coveted files.

### The Fine Print

The manual goes to great lengths stating the need to use a data disk formatted just for *Partner 128.* The guide makes it seem as if regularly formatted floppies won't work. This is not the case. One word of warning is accurate, however; 128 virtuosōs should not activate the cartridge during disk reads or writes. After all, "diskus interruptus" rarely does anyone any good.

Several 128 programs use a security key or dongle in Port 2, one of the places where *Partner* connects. For the most part these applications can still be used; merely plug *Partner* into Port 1 and the key into Port 2. Then call *P 128* with the following action: <CTRL (PARTNER 128 button)>. (Timeworks sells a Y cable adapter for these situations, though it is not necessary.)

Advanced (machine language) programmers can load other utilities into *Partner*, though this severely restricts file capacities. OUT OF MEMORY messages could become a painful way of life.

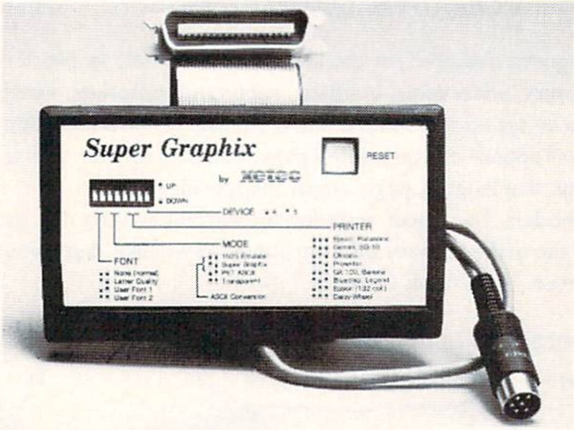
### Do You Need a Partner?

Of course, you are the only one who can really tell. *Partner 128*, as noted in the sidebar, is highly compatible with most applications. Furthermore, it provides features not found anywhere else at any price.

However, a monopoly is no reason to buy a product. The real reasons for purchasing *Partner 128* include enhanced productivity, and unbeatable convenience.

Timeworks, Inc., 444 Lake Cook Road, Deerfield, IL 60015 (phone: 312-948-9200). *—Ted Salamone*


# Super Graphix




**Includes: Utility Disk With 27 Fonts And Font Creator**

**GRAPHICS and FONTS plus an 8K BUFFER for the ultimate in performance and speed. The XETEC Super Graphix interface for Commodore Computers now offers a new high in technology with these features:**

- 8K Buffer Standard
- 10 Printing Modes
- 3 Internal Screen Dumps
- Extensive Command Channel
- Reset Button to Halt Printing from Buffer
- Switch Settings on Label for Quick Reference
- Correspondence Quality Font Built-In
- Capable of Storing 2 Additional Fonts
- Correct Graphics/Text Aspect Ratio for all Major Printers
- 8 Active Switches with Changes Constantly Monitored
- Internal Fonts Support Super-script, Sub-script, Underlining, Bold-face and Choice of 9 Pitches

***Suggested list $99.95 • Includes Lifetime Warranty***

**xetec, Inc. / 2804 Arnold Rd. / Salina, KS 67401 / 913-827-0685**

Reader Service No. 199

# SAVE WITH THE AHOY! DISK MAGAZINE

The money-saving subscription rates for *Ahoy!* magazine and the *Ahoy!* program disk are now even lower!

If you subscribe to the *Ahoy! Disk Magazine*—magazine and disk packaged together—you'll receive the two at substantial savings over the individual subscription prices!

| YEARLY SINGLE ISSUE PRICE (12 ISSUES) | | SEPARATE SUBSCRIPTION PRICE (12 ISSUES) | |
|---|---|---|---|
| Magazine: | $ 33.00 | Magazine: | $ 21.95 |
| Disk: | $107.40 | Disk: | $ 79.95 |
| TOTAL: | $140.40 | TOTAL: | $101.90 |

AHOY! DISK MAGAZINE 12 ISSUES $88

Use the postpaid card bound between pages 66 and 67 of this magazine to subscribe. (Canadian and foreign prices are higher.)

The *Ahoy! Disk Magazine* is also available at Walden and B. Dalton's bookstores, as well as other fine software outlets.

# S.O.S.

No problem is too tough for *Ahoy!'s* crack technical crew. Just send your programming or hardware questions to: S.O.S., c/o Ahoy! Magazine, 45 West 34th Street—Suite 407, New York, NY 10001.

## By Tim Little

I am using a Commodore 64 computer, two 1541 disk drives, and a 1660 modem with the Higgyterm terminal software (the program supplied by Commodore with the 1660). When I logged on to *Ahoy!'s* bulletin board, I was advised not to attempt to download programs unless I was using an 8-bit Punter terminal program.

What is the Punter protocol? What terminal software uses it?

—Robert H. Croswell
Trappe, MD

*The Punter Protocol is a method of sending a data file from one computer to another computer. It sends the data in groups of bytes with a checksum byte transmitted after the receiving system declares that it is ready for another "packet" of data. After the checksum byte is verified with the computed checksum, it will either agree, in which case the next packet is transmitted; or a discrepency will have occurred, and the receiving system will ask the other system to transmit the data again until the checksums match. This insures an error-free file transfer, or at least reduces the probability of erroneous data being transmitted.*

*There are many terminal programs on the market as well as in the public domain. A few are* Bob's Term Pro, Blitz Term, Eagle Term, First Term, Hal Term, Super Punter *and* Versa Term. *Check the package before you buy.*

---

Some of the programs I use will not allow me to print out parts of a report that can be displayed on the screen. Furthermore, these programs are protected so I can't modify them. The *Screen Dump* program (Aug. '85) could be of some use to me if I could use a function key that I could push any time I wanted to print out a screen display. Can you help?

—John Mackey
Creswell, OR

*Unfortunately, unless you become quite proficient at machine language program deprotection and modification, the program* Screen Dump *will be of no use in this respect. Most commercial programs incorporate protection schemes that will disable any utilities that are in the machine in order to boot, thus few commercial programs will allow any software screen dump programs to function.*

*My suggestion is dependent upon your need to print*


NOW GET TRUE DECENDERS FOR 801, 1525, GP-100 HUSH 80 & SIMILAR PRINTERS
*From the Decender ROM People*

WILANTA ARTS

SAMPLE ACTUAL SIZE
gyps
pager
peopl

FEATURING:
- True decenders
- A pleasing alternative
- Uniform character formation
- No change in graphic capability
- No change in software compatibility
- No change in printer operation
- North American standard font
- Complete instructions
- Easy installation
- No soldering

$39.95 Cdn $29.95 U.S.

*Please Specify Printer*
Ont. Residents add 7% Prov. Sales Tax
Cheque, Money Order, Visa or MasterCard

VISA
WILANTA ARTS
6943 Barrisdale Dr., Mississauga, Ont., L5N 2H5
1-416-858-9298

*Get a Wilanta Decender ROM Today and make your old nightmare just a font memory of yesterday!*

Reader Service No. 201



COMPUTER REPAIR
800-221-7770

| | | | |
|---|---|---|---|
| Commodore Disk Drive 1541 1571 | $60.00 | Commodore Monitor 1701 1702 | $60.00 |
| Commodore SX-64 Portable Computer | $85.00 | 64 | $45.00 |
| Commodore Printer MPS 801 MPS 803 | $50.00 | Commodore Printer 1526 MPS 802 | $60.00 |
| MSD Commodore Compatible Dual Disk Drive C128 CBM | $85.00 | Commodore Computer 8032 8050 | $65.00 |

AUTHORIZED commodore SERVICE CENTER

We Buy Computer Equipment

| ALIVE | |
|---|---|
| 64 | 75.00 |
| 1541 | 85.00 |
| 8050 | 150.00 |
| DEAD | |
| 64 | 50.00 |
| 1541 | 60.00 |
| 8050 | 100.00 |

PARTS FOR SALE

Please add 5.00 for shipping

Commodore Parts For Sale

| | |
|---|---|
| 82S100 | 18.95 |
| 6502 | 5.95 |
| 6504 | 5.95 |
| 6520 | 5.95 |
| 6522 | 5.95 |
| 6526 | 14.95 |
| 6567 | 19.95 |
| 6581 | 19.95 |
| 6510 | 10.95 |
| 4164 | .99 ea. |

CALL FOR OTHERS

T.C ELECTRONICS
HWY 36 PO 1129
HARTSELLE, AL. 35640
800-221-7770

Reader Service No. 204

*out the information as well as the program you are using. Almost any cartridge-based screen dump will perform the task, and many are available at local software distributors. This is just a sampling:*

Freeze Frame *(Cardco)*
Screen Dump Etc. *(IRQ, Inc.)*
HardCopy *(FS! Software)*

*Be sure that the above programs will work with your specific printer as well as your specific program.*

---

*Many readers have complained that while writing their own programs, they have found serious bugs in the C-64's BASIC interpreter. One such bug is called the input-prompt bug and the only solution appears to be to avoid it altogether. The following reader offers a solution as well as the cause:*

If an INPUT line contains a prompt (such as INPUT "Would you like a few more problems (Y/N)";A$) which contains 39 characters or more, or if the INPUT statement is preceded by a PRINT statement which contains a string of 39 or more characters and is followed by a semicolon, then the prompt in the INPUT or the string which follows the PRINT may become concatenated with the actual input variable. If the variable was a numeric variable, then the attempted combination with a string produces a REDO FROM START message on the screen. If the variable was a string (INPUT A$) then the combined input will be stored in the variable. This is obvious when you print out the new variable, but can wreak havoc when used in IF...THEN statements. —Jack Ryan
El Dorado, AR

*His solution is to keep prompts to a 38 or less character minimum, and I do agree since this is not a real inconvenience.*

---

After reading several books on bit mapped graphics on the C-64's high resolution screen, I noticed that all of them failed to mention how to turn off a pixel after turning it on. I would appreciate the formula in BASIC.
—Robert Cario
Merrick, NY

*I will assume that you are familiar with the first five of the following six formulas. These formulas will let you turn off any pixel at location (X,Y) where X can range from 0 to 319 and Y can range from 0 to 199. BASE is the address of the hi-res screen.*

```
ROW = INT(Y/8)
COL = INT(X/8)
LINE= Y AND 7
BYTE= ROW*320 + COL*8 + LINE + BASE
BIT = 7 - (X AND 7)
POKE BYTE,PEEK(BYTE) AND (255 - 2^BIT)
```


## GREAT PRODUCTS FOR YOUR COMMODORE

*promenade* C1™

The Eprom Programmer. Thoughtfully designed, carefully constructed, the *promenade* C1™ is respected around the world for quality and value. The original software controlled programmer does away with personality modules and switches. Intelligent programming capability can cut programming time by 95%! With Disk Software ........... still just $99.50

**CAPTURE™**

Take control of your '64 or '128* with this easy to use cartridge. Lets you make a back-up disk of your memory-resident software. Your program is then fully accessible to you and your program can be re-booted from your disk 3-5 times faster. Or make an auto-starting cartridge using the *promenade* C1 and a CPR cartridge kit. Its magic!

**CAPTURE™** is a bargain at 39.95

**CARTRIDGE MATERIALS:**

CPR-3 - Three socket board, case and 3 eproms, for use with **CAPTURE™** ........ 29.95
PCC2 - Two 2732 (4K) or 2764 (8K) eproms. For '64 or '128 in 64 mode ........ 4.95
PCC4 - Four sockets for 2764, 27128 or 27256 (32K) eproms. Bank switching ........ 17.95
PCC8 - Like the PCC4 but twice the capacity. For multiple programs ........ 29.95
PRB4 - Four sockets, eprom & battery backed RAM combination ........ 24.95
PTM2 - Basic 128 mode cartridge board. Two 2764 or 27128 eproms ........ 5.95†
PTM4 - Four sockets, 27128 & 27256 eproms. 128 mode bank switcher ........ 19.95†
PCCH2 - Plastic case for above cartridges (except PCC8) ........ 2.25
Eproms - Always in stock at competitive prices.

†available June '86.
*when in 64 mode.

**EPROM ERASERS:**

Datarase - Hobbyist eprom eraser, 2 at a time, 3 to 10 minutes ........ 34.95
PE14 - Industrial quality eraser, 7 to 9 at a time ........ 79.95
Starter Set - **CAPTURE™**, *promenade* C1 and one CPR3 kit ........ 149.95
Deluxe Set - **CAPTURE™**, *promenade* C1, Datarase and two CPR3 kits ........ 199.95

**SHIPPING & HANDLING: USA - UPS SURFACE $3.00 FOREIGN (AIR MAIL ONLY) $13.00**

**JASON-RANHEIM**
1805 INDUSTRIAL DRIVE
AUBURN, CA USA 95603

TO ORDER TOLL FREE 800-421-7731
FROM CALIFORNIA 800-421-7748
TECHNICAL SUPPORT 916-823-3284
FROM OUTSIDE USA 916-823-3285
**MC, VISA, AMEX WELCOME**

Reader Service No. 205

# "TAKE A BYTE OUT OF THIS"

### ABACUS

| | |
|---|---|
| Ada Training Course | $29.95 |
| Basic 128 | 42.95 |
| Basic 64 | 29.95 |
| Cadpak 128 | 45.95 |
| Cadpak 64 | 29.95 |
| Cadpak 64 w/Light Pen | 69.95 |
| Chartpak 128 | 29.95 |
| Chartpak 64 | 29.95 |
| Cobol | 29.95 |
| Personal Portfolio Manager | 29.95 |
| Powerplan | 29.95 |
| Super C Compiler 64/128 | 42.95 |
| Super Pascal | 45.95 |
| Techinical Analysis System | 45.95 |

### BRODERBUND

| | |
|---|---|
| Where in the World is Carmen Sandiago | 29.95 |
| P/S Library 1-2-3 | 15.95 |
| Print Shop | 26.95 |
| Print Shop Companion | 21.95 |

### MICRO LEAGUE

| | |
|---|---|
| General Managers Disk | $24.95 |
| Micro League Baseball | 24.95 |
| Team Disks | 16.95 |

### RIBBON

| | |
|---|---|
| Axiom Elite 5 LCD | $ 5.95 |
| Brother 15, 25, 35 | 5.95 |
| Commodore 1525 | 6.95 |
| Commodore 1526 | 6.75 |
| Epson 185 | 6.95 |
| Epson 85 | 4.95 |
| Epson mx, fx, rx 100 | 6.95 |
| Epson mx, fx, rx, 1x 80 | 4.75 |
| Gorilla Banana | 6.95 |
| Juki 6000 | 4.95 |
| Juki 6100 | 3.95 |
| Legend 880, 1080, 808 | 6.75 |
| MPS 801 | 5.75 |
| MPS 803 | 6.95 |
| OKI 182, 192 | 9.75 |
| OKi 82, 92, 83, 93 | 2.25 |
| SG 10-15 | 2.25 |

*(Min. 6 per order)*

### INFOCOM

| | |
|---|---|
| Ballyhoo | $24.95 |
| Enchanter | 21.95 |
| Hitchhicker's Guide | 21.95 |
| Invisiclues (all) | 6.00 |
| Spellbreaker | 26.95 |
| Zork 1-2-3 | 25.95 |
| Trinity 128 | 24.95 |

### PRECISION

| | |
|---|---|
| Superbase 128 | $56.95 |
| Superbase 64 | 46.95 |
| Superscript 128 | 47.95 |
| Superscript 64 | 46.95 |

### AICP

| | |
|---|---|
| Disk Drive Cleaner | $ 7.95 |
| Disks (10) | 7.95 |
| Printer Head Cleaner | 7.95 |

### NEW RELEASES

| | |
|---|---|
| Pure Stat Baseball | 34.95 |
| Partner 1 2 8 | 42.95 |
| Ace | 14.95 |
| Graphic Expander | 21.95 |
| Murder on the Mississippi | 21.95 |
| Where in the World is Carmen Sandiago | 21.95 |
| Chessmaster 2000 | 26.95 |
| Commando | 21.95 |
| Geos | 37.95 |
| Trinity 128 | 37.95 |
| Super Cycle | 24.95 |

### DIGITAL SOLUTIONS

| | |
|---|---|
| Pocket Filer 128 | $31.95 |
| Pocket Filer 64 | 24.95 |
| Pocket Planner 128 | 31.95 |
| Pocket Planner 64 | 24.95 |
| Pocket Writer 128 | 31.95 |
| Pocket Writer 64 | 24.95 |

### MICROPROSE

| | |
|---|---|
| Conflict in Vietnam | $24.95 |
| Crusade in Europe | 24.95 |
| F-15 Strike Eagle | 21.95 |
| Silent Service | 21.95 |

### SPRINGBOARD

| | |
|---|---|
| Clip Art I | $20.95 |
| Clip Art II | 24.95 |
| Newsroom | 30.95 |
| Graphic Expander | 21.95 |

### ACCESS

| | |
|---|---|
| Leader Board | $24.95 |
| Leader Board Tournament Disk | 14.95 |
| Mach 128 | 30.95 |
| Mach 5 | 21.95 |

### ELA

| | |
|---|---|
| Bard's Tale | $24.95 |
| Lords of Conquest | 24.95 |
| Movie Maker | 24.95 |
| Chessmaster 2000 | 26.95 |
| Mind Mirror | 21.95 |
| Ultimate Wizard | 19.95 |

### TIMEWORKS

| | |
|---|---|
| Data Manager 128 | $42.95 |
| Data Manager II | 29.95 |
| Partner 128 | 42.95 |
| Swift Calc 128 w/Sideways | 42.95 |
| Swift Calc 64 w/Sideways | 29.95 |
| Word Writer 128 w/Speller | 42.95 |
| Word Writer 64 w/Speller | 29.95 |

### ACTIVISION

| | |
|---|---|
| Alter Ego | $29.95 |
| Cross Country Road Race | 19.95 |
| Mindshadow | 19.95 |
| Murder on the Mississippi | 21.95 |

### ACCESSORIES

| | |
|---|---|
| WICO Boss Joystick | $11.50 |
| WICO Bat Handle Joystick | 15.50 |
| WICO Three Way Joystick | 18.95 |
| Disk Notcher | 5.95 |
| Kraft Joystick | 6.95 |
| Data Case (50) | 7.95 |
| Flexidraw | CALL |
| Xetek Graphic Interface | 54.95 |
| Xetek Jr. | 34.95 |

***SPECIAL SAVINGS***
**FREE**
***PRINTER HEAD CLEANER KIT***
**with every**
**RIBBON ORDER**

### BATTERIES INCLUDED

| | |
|---|---|
| Consultant 64/128 | $39.95 |
| Paper Clip 64/128 | 39.95 |
| Paper Clip w/spell 64/128 | 49.95 |

### ACCOLADE

| | |
|---|---|
| Dambusters | $18.95 |
| Fight Night | 18.95 |
| Hard Ball | 18.95 |
| Law of The West | 18.95 |
| PSI 5 Trading Comp | 18.95 |

### SUBLOGIC

| | |
|---|---|
| Flight Simulator II | $34.95 |
| Football | 27.95 |
| Jet | 27.95 |
| Scenery Disks 1-6 | 14.95 ea |
| Pure Stat Baseball | 34.95 |

### KOALA

| | |
|---|---|
| Koala Pads 64 | $42.95 |
| Koala Printer Utility | 16.95 |
| Programers Tool Kit | 24.95 |

### MINDSCAPE

| | |
|---|---|
| Bop and Wrestle | $18.95 |
| Infiltrator | 18.95 |
| Halley Project | 24.95 |

### EPYX

| | |
|---|---|
| Fast Load | 23.95 |
| Multiplan 64/128 | 40.95 |
| Programmers Tool Kit | 27.95 |
| Vorpal | 21.95 |
| World Karate Championship | 18.95 |
| Worlds Greatest Baseball | 23.95 |

### COMMODORE HARDWARE

| | |
|---|---|
| C-128 | CALL |
| C-1571 | CALL |
| C-1902 | CALL |
| C-1670 Modem 1200 | CALL |
| C-1350 Mouse | CALL |

### HOT SELLERS

| | |
|---|---|
| Geos | $37.95 |
| Koala Pad | 42.95 |
| Bards Tale | 24.95 |
| Cadpak 64 | 29.95 |
| Cadpak 128 | 45.95 |
| Leader Board | 24.95 |
| Koala Printer Utility | 16.95 |
| Elite | 18.95 |
| Bop n Wrestle | 18.95 |
| Print Shop Companion | 21.95 |

### FIREBIRD

| | |
|---|---|
| Elite | $18.95 |
| Colossus Chess IV | 21.95 |
| Frankie Goes To Hollywood | 21.95 |
| Music Systems | 24.95 |
| Advance Music Systems | 49.95 |

### 2 Games In One

| | |
|---|---|
| All Titles Available | $13.95 |
| Gerry The Germ/ Microcosm | 13.95 |
| Willow Pattern Chimera | 13.95 |
| UnderWurlde Sabre Wulf | 13.95 |
| Booty/Cylu | 13.95 |
| Runestone/The Helm | 13.95 |
| Chicken Chase/Rasputin | 13.95 |
| Battle of Britian Battle for Midway | 13.95 |
| ARC of Yesod Nodes of Yesod | 13.95 |

### AMIGA SOFTWARE

| | |
|---|---|
| Borrowed Time | $27.95 |
| Hacker | 27.95 |
| Mindshadow | 27.95 |
| Music Studio | 37.95 |
| Aegis Animator w/Images | 89.95 |
| Aegis Draw | 124.95 |
| Archon | 29.95 |
| Deluxe Paint | 72.95 |
| Skyfox | 29.95 |
| Rogue | 24.95 |
| Temple of Apshai Trilogy | 24.95 |
| Master Type | 24.95 |
| Halley Project | 29.95 |
| Racter | 32.95 |

### HITS

| | |
|---|---|
| Int'l Hockey | $16.95 |
| Kung Fu II | 19.95 |
| Gato | 19.95 |
| Fontmaster II | 31.95 |
| Master Modem | 34.95 |
| Ultima III & IV | ea. 39.95 |

### SSI

| | |
|---|---|
| Battle Of Antietam | $29.95 |
| Carrier Force | 36.95 |
| Kampfgruppe | 36.95 |
| Phantasie II | 24.95 |
| Rings of Zelphin | 24.95 |
| Wings of War | 24.95 |
| Wizards Crown | 24.95 |

# CALL US TOLL FREE

## Orders 1-800-634-AICP Only

***Customer Service***
**718-351-1864**
**10AM to 6PM**
**E.S.T.**

AMERICAN INTERNATIONAL
COMPUTER PRODUCTS
P.O. Box 1758
Staten Island, N.Y. 10314

A.I.C.P.

**ORDER INFO**

In stock items shipped within 24 hours for prepaid orders (cert. check, visa, m/c.) C.O.D. orders accepted, please add $4.00, must be cash or cert. check ONLY. NY State Residents add 8¼% sales tax. Advertised prices reflect a 4% discount for cash, credit card add 4%. All orders add $3.50 shipping and handling within the Continental U.S. International orders add $15.00 + shipping & handling. Personal checks allow 2 wks. for clearance. Availability and Pricing subject to change without notice. Orders over $150.00 receive free shipping in Continential U.S. School inquiries invited. Make all checks payable to American International Computer Products. DEFECTIVE EXCHANGES ONLY, REQUIRE RETURN AUTHORIZATION NUMBER.

# INTRODUCING...MAXI-DISK

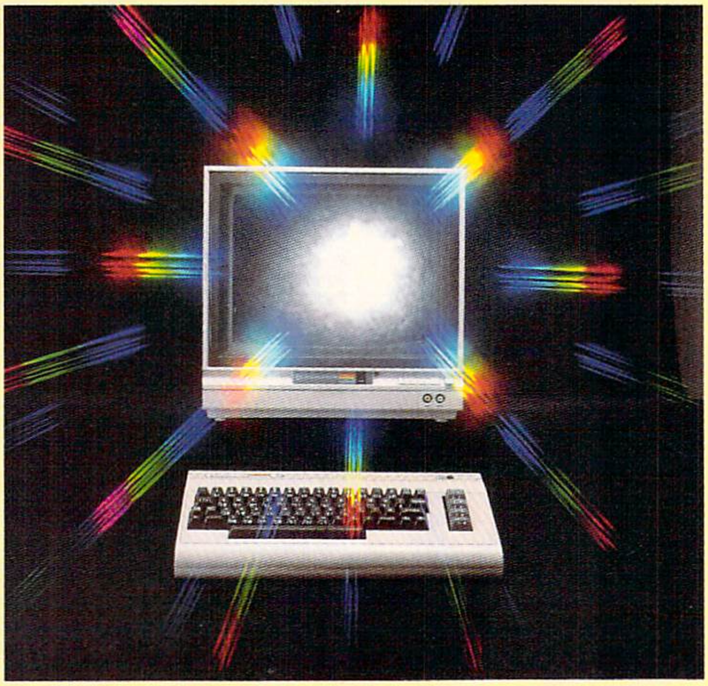
## "Programs by Users, for Users"

### THE NEW MONTHLY PUBLICATION ON DISK FOR YOUR C-64 AND C-128

10 powerful and exciting programs for your Commodore computers not seen in any other publication at a price hardly worth mentioning. Disk comes with a booklet with complete instructions for all programs.

**WINDOW 64**
Professionalize your basic programs with this simple but powerful ML routine.

**1541 DISK MONITOR**
The MOST powerful and complete disk utility we've ever seen published anywhere.



**VIDEO SIDEKICK**
The program all VCR owners need. Auto-sorting, Fancy labels and much, much more.

**THE LOST SWORD**
Make your way through this graphic adventure to find the lost sword but be careful....

**ALSO ON THIS DISK: File Copy, Converter, Stalkers, Obsession, Leprechan's Gold, Disk Lock.**
**REVERSE SIDE: Postmaster 128**

**PREMIER ISSUE BONUS**
A full featured mailing list program for the C-128/80 column

MICRO-TEK
P.O. BOX 1861
STATEN ISLAND, NY 10314

**Please *RUSH* me the following order (postage and handling included):**

| | USA | FOREIGN |
|---|---|---|
| ☐ Volume 1 (Nov. '86) issue of the "MAXI-DISK" | $ 12.95 | $ 15.95 |
| ☐ 1 Year Subscription of the "MAXI-DISK" | $119.95 | $139.95 |

Make checks payable to Micro-Tek Software. New York residents add 8.25% sales tax.

Name________________ Address________________

City____________ State____________ Zip________

## ARE YOUR PROGRAMS GOOD ENOUGH?

**MICRO-TEK** Software is looking for quality games, utilities or business programs written by you, the computer enthusiast, to share with your fellow hackers. At the same time, you can make extra cash and get the satisfaction and recognition you deserve.

**MICRO-TEK** publishes the **"MAXI-DISK" "MAXI-DISK"** is a C-64 program disk with 10 quality programs, not published by any other publication. A new and exciting program disk is produced each and every month. Our premier disk will be available November 1986.

If you are interested in submitting your programs, please observe the following rules:

1. **All programs must be written and owned by you and submitted on C-64 formatted disk.**
2. **Typed, double-spaced documentation must accompany the program.**
3. **Rejected submissions will only be returned with S.A.S.E.**
4. **Prices subject to quality and length of program.**
5. **Upon acceptance, you will be sent a contract to which you must sign and return.**

**MICRO-TEK Software** pays generous royalties to programmers based on the number of disks sold for as long as the disk is for sale.

# LONG LINES

## Code Consolidation for the 64

### By Rick Nash

*Long Lines* is a short utility program that will improve the Commodore 64's line editor. As you probably know, the standard line length is 80 characters, or two screen lines. This utility will double the editor's capability to 160 characters (four screen lines).

The reason for longer BASIC lines is twofold. Programs will run slightly faster, and fewer lines means less memory overhead. Each BASIC program line requires a minimum of five bytes. For very large programs, combining many small lines into fewer long lines can result in substantial memory savings.

### ENTERING *LONG LINES*

Enter and save a copy of the listing on page 132. This is a program generator which, when run, will produce a machine language program directly to tape or disk with the filename "LONG LINES". To use, simply LOAD "LONG LINES", dv,1 where dv is 8 for disk, or 1 for tape. Next, execute *Long Lines* with SYS 49152, and enter NEW. At this point, you can write or edit up to four screen lines for each BASIC line.

Programs written with long lines can be loaded, saved, or run without the utility, but do not edit any long lines, as they will be truncated to the normal 80 character length.

Both BASIC and the Kernal are moved to RAM, and heavily patched. You must reexecute *Long Lines* (SYS 49152) after a RUN STOP/RESTORE or a RESET. □

*SEE PROGRAM LISTING ON PAGE 132*


Authorized COMB Liquidator

COMMODORE® COMPATIBLE ACCESSORIES




FAMOUS U.S. BRAND DISK DRIVE UNIT

These famous brand Disk Drives are rebuilt, like new, by factory technicians. They are at a **LOW liquidation price,** and carry a **Factory Warranty.**

- Compatible With Commodore® C64™ and SX64 Computers for Maximum Efficiency.
- 2K RAM, 16K ROM. Maximum Storage of 170K Formatted Data, 35 Tracks.
- Uses 5¼" Floppy Diskettes. Serial Interface.
- Data Transfer Rate: 400 Bytes per Second.
- Second Serial Port for Chaining Second Drive or Printer.
- 3¾" H x 8" W x 15" D. 9½ lbs.

**Now, Make Quick Back-Up Copies Easily With a SECOND Disk Drive!**

**Original List Price ...... $269.00**

**Liquidation Price ..... $149**

Item H-1700-3553-013
Shipping, handling: $8.00 ea.

FOUR PACK OFFICE SOFT-WARE

90-Day Ltd. Fac. Warranty.




NOTE: Software sold individually. Phone for Prices.

- **General Ledger.** 8 Options. Chart Accounts, Custom Statements, More.
- **Inventory Managment.** Track 1000 Items. Maintain Perpetual Records.
- **Payroll.** 24 Functions. Calculates Tax. Prints Checks. Interface Ledger.
- **Accounts Payable/Checkwriting.** Interfaces With General Ledger.

**Mfr. List For Set of 4: $199.80**

**Liquidation Price For Set of 4 ...... $39**

Item H-1700-7025-059 Ship, handling: $4.00 pkg.

TRACTOR FEED FROM COMMODORE®

Discontinued Model LOW Liquidation Price.

- Adapts Your Commodore 803 for Continuous Paper.
- Continuous Form Paper from 2¾" To 10" Wide.
- You Can Still Use Your Friction Feed.

**90-Day Ltd. Factory Warranty.**

Commodore is a registered trademark of Commodore Electronics Ltd.

**Mfr. List .... $39.95**

**Liquidation Priced At ... $19**

Item H-1700-7004-286
Shipping, handling: $4.00 each

**Toll-Free: 1-800-328-0609**

Credit card customers can order by phone, 24 hours a day, 7 days a week.

VISA MasterCard AMERICAN EXPRESS

SEND TO: Item H-1700
C.O.M.B. Direct Marketing Corp.
1405 Xenium Lane No./Minneapolis, MN 55441-4494
Send the items indicated below. (Minnesota residents add 6% sales tax. Sorry, no C.O.D. orders.)
Send ___ **Disk Drive(s)** Item H-1700-3553-013 at $149 each plus $8 each for shipping, handling.
Send ___ **Software Package(s)** Item H-1700-7025-059 at $39 each plus $4 each for shipping, handling.
Send ___ **Tractor Feed(s)** Item H-1700-7004-286 at $19 each plus $4 each for shipping, handling.

□ My check or money order is enclosed. (No delays in processing orders paid by check).

Charge: □ VISA® □ MasterCard® □ American Express®

Acct. No. __________ Exp. ___/___

PLEASE PRINT CLEARLY

Name __________

Address __________

City __________

State __________ ZIP __________

Phone ( )

Sign Here __________

Sales outside the 48 contiguous states are subject to special conditions. Please call or write to inquire.

COMB COMB COMB COMB COMB

# GUARDIAN

## For the C-64

### By Cleveland M. Blakemore

In the year 4025, the star Sol far on the rim of the Milky Way spiral began to pass through a massive gas cloud, dragging the earth and surrounding planets with it. The gas cloud was no natural phenomenon left over from the Big Bang, but the debris and residue of one of the largest intergalactic wars ever fought.

The motives and identities of the long-dead civilizations that were involved are forever lost in the miasma of time, but unfortunately the machines they built to wage war for them are still functioning.

The other major planets have already been destroyed, and the earth is calculated to be next in line, although earth's scientists are not quite sure what is in store for us.

Reconaissance has revealed several synthetic moons with trenches running the circumference, ending in colossal pyramids topped with strange power crystals. The scientists know that the moons are in orbit with an artificial gravity well, a "black hole" which somehow draws its energy from the power crystal on top of the pyramid.

When the crystal lines up with the black hole, anything intersecting the conjunction will be annihilated. Earth's terrified masses have taken to calling the crystals "the eyes of doom."

Earth's greatest pilots have been scraped together amidst the hysteria to fly a suicide mission across the surface of the moon, through the trench towards the pyramid. Your mission is to destroy the pyramid before the black hole aligns with "the eye of doom." Just before the pyramid releases its deadly blast of energy, our scientists believe a second crystal opens at the base of the pyramid. If you can fire a laser torpedo down this opening, they believe the pyramid's power source will be knocked out of commission, and the earth will be saved!

---

In the 3-D game *Guardian*, you fly a shuttlecraft down a constantly scrolling trench, avoiding or blasting the weird machines that attack you in endless ranks, launched from the pyramid far away on the horizon.

The pyramid grows larger as you approach it, while the earth moves across the sky in the background. If you look closely, you may see the "black hole" as it approaches from the other side of the screen.

There are two types of flying machines that attack you: white alien fighter ships (500 points) and cyan fighter ships (1000 points). There are two types of ground rolling robots: light green (1500 points) and dark brown (2000 points).

Since the game is in 3-D, your altitude directly controls the height of your laser fire, so you must be at the same altitude to destroy an alien fighter craft. You can judge the height by looking at the distance between the fighter ship and its shadow. To dive, push up on the joystick. To fly higher, pull back. Your shadow shows you the approximate distance from the moon's surface. When you are lined up with a ship in flight coming at you, your shadow should appear to be approximately the same distance from your ship as his.

The robots are a different menace altogether. They have slits in the front of their chassis, the only weak spot in their armor. Fire a shot through this slit and the robot will be nuts and bolts. The robot has a very high reach with his electronic arms, so you will have to get some altitude to fly over him! Once you get the height correct, you can sit in place and plink at robots all day long and rack up points.

Avoid the plasma balls the aliens fire at you as they approach.

The best shot at an alien comes as they appear on the horizon. As they get closer, you have to be more accurate with the altitude.

The power crystal appears as a flashing eye at the base of the pyramid. You have only seconds to hit it before the earth explodes. If you successfully knock a pyramid out, the screen colors change, and you are on the surface of another guardian moon. The aliens get progressively faster each time you wipe out a pyramid, so you will have to be more tricky in avoiding them and more selective with your shots.

You only have three ships in the game, displayed at upper right. The current score is at upper left in yellow.

This game uses extended background mode for the scrolling color bars, rotating the three colors to give the illusion of motion. This is an ancient trick on the Commodore, and highly effective, even in BASIC programs. (Although the idea is simple enough and very snazzy, I think we have yet to see some of the incredible games that could be created with EBC mode.) The pyramid itself is constructed with redefined character graphics.

My high score so far is 54500. It is theoretically possible to flip the game over past 650,000, but even I would do a double take on that one. If you should flip this game over, please let me know via a letter to *Ahoy!*, and I will incorporate a three byte scoring system in my next game to keep you joystick superjockeys happy!

Enjoy *Guardian*.

Now save the earth! □

*SEE PROGRAM LISTING ON PAGE 137*

# Back Issues

**SPECIAL ANNOUNCEMENT!** A small cache of *Ahoy!* #2 (Feb. '84) has been uncovered, and is available at $10 per copy while limited supplies last.




**SORRY... ISSUES #1, 2, AND 4 SOLD OUT!**

**ISSUE #3–MAR. '84 $4.00**
Anatomy of the 64! Printer interfacing for VIC & 64! Educational software series begins! And ready to enter: Address Book! Space Lanes! Random Files on the 64! Dynamic Power!

**ISSUE #5–MAY '84 $4.00**
Future of Commodore! Inside BASIC storage! Memory management on the VIC & 64! Guide to spreadsheets! And ready to enter: Math Master! Air Assault! Biorhythms! VIC Calculator!

**ISSUE #6–JUNE '84 $4.00**
Game programming column begins! Program generators! Rupert on inputting! Memory management continues! And ready to enter: Post Time for the 64 & VIC! Alpiner! Sound Concept!

**ISSUE #7–JULY '84 $4.00**
MSD dual disk drive! Database buyer's guide! Training your cursor! Screen displays! File Sleuth! Users Groups! And ready to enter: Renumbering! Checklist! Math Defender! Brisk!

**ISSUE #8–AUG. '84 $4.00**
Choosing a word processor! Computational wizardry! Creating your own word games! Sound on the 64! And ready to enter: Micro-Minder! Directory Assistance! The Terrible Twins!

**ISSUE #9–SEPT. '84 $4.00**
Program your own text adventure! Build a C-64 cassette interface! Video RAM! And ready to enter: Salvage Diver! DOS! Sound Explorer! The Castle of Darkness! Base Conversions!

**ISSUE #10–OCT. '84 $4.00**
C-64 graphics programs! Bit-mapped graphics! Joystick programming! And ready to enter: VIC 40 Column Operating System! BAM Read & Print! Emerald Elephant! Lawn Job!

**ISSUE #11–NOV. '84 $4.00**
Music programs & keyboards for the 64! Graphics feature continues! And ready to enter: PTE word processor! Block Editor! Alternate Character Set for the 64! The Tunnel of Tomachon!

**ISSUE #12–DEC. '84 $4.00**
Buyer's guide to printers! 1525 printer tutorial! Custom characters! User Guide to KMMM Pascal! Diving into BASIC! And ready to enter: Construction Co.! Space Patrol! Cross Ref!

**ISSUE #13–JAN. '85 $4.00**
VIC/64 OS exposed! Sprites! 1541 device # disconnect switch! Ghostbusters! And ready to enter: Ultra Mail! Music Tutor! Alice in Adventureland! Midprint! To the Top! Tape/Disk Transfer!

**ISSUE #14–FEB. '85 $4.00**
Printer interfacing! Multicolor sprites! Modems! Bulletin boards! Theory of game design! And ready to enter: Futurewar! Fontasia! VIC Eraser! Insurance Agent! Flankspeed! Telelink 64!

**ISSUE #15–MAR. '85 $4.00**
Making multiscreen gameboards! Inside the Plus/4! Commodore DOS! And ready to enter: Old Routine! Programmable Functions! Automatic Line Nos.! Home Budget! Salmon Run!

**ISSUE #16–APR. '85 $4.00**
Assembly language column begins! Programming the joystick! 1541 disk drive alternatives! And ready to enter: Hop Around! Faster 64! Booter! Elecheck! BASIC Trace! Space Hunt!

**ISSUE #17–MAY '85 $4.00**
Disk drive enhancements! Install a reset switch! Assembler escapades! And ready to enter: Super Duper! Two-Column Directory! DSKDU! Raid! DOS Plus! Font Editor! Tile Time!

**ISSUE #18–JUNE '85 $4.00**
Music & graphics entry systems! How modems work! Inside the 6510! And ready to enter: Quad-print! Mapping 4.4! Towers of Hanoi! Speedy! Duck Shoot! The 6510 Simulator!

**ISSUE #19–JULY '85 $4.00**
PROM programming! 3-part harmonies on VIC/64! Speeding pixels! And ready to enter: Auto-Append! Script Analysis! Wizard of Im! Lucky Lottery! Brainframe! Etch! Printat!

**ISSUE #20–AUG. '85 $4.00**
Inside the 128! Read-world simulations! Sound effects! And ready to enter: Windows! Formatter! Sound-a-Rama! Screen Dump! Selectachrome! Disintegrator! Fidgits! Gators N Snakes!

**ISSUE #21–SEP. '85 $4.00**
Inside the 1571 drive and 128 keyboard! Sprite programming! And ready to enter: Fastnew! Go-Lister! File Lock! Dragon Type! Superhero! Auto-Gen! Moxey's Porch! Fish Math!

**ISSUE #22–OCT. '85 $4.00**
Create cartoon characters! Infinitesimal intrigue! Inside copy protection! And ready to enter: Shotgun! Maestro! Solitaire! Mystery at Mycroft Mews! Gravinauts! 1541 Cleaning Utility! ShadeyDump!

**ISSUE #23–NOV. '85 $4.00**
Adventure gaming! ML sprite manipulation! BASIC for beginners! And ready to enter: Lightning Loader! Knight's Tour! Chopper Flight! Rhythmic Bits! Instant Bug Repellent! File Scout! Slither!

**ISSUE #24–DEC. '85 $4.00**
Speech synthesizers! The IBM Connection! The year's 25 best entertainments! And ready to enter: Gypsy Starship! Directory Manipulator! Cloak! Gameloader! Jewel Quest! Lineout! Santa's Busy Day!

**ISSUE #25–JAN. '86 $4.00**
Build a speech synthesizer! Survey of sports games! And ready to enter: The Martian Monsters! Streamer Font! Microsim! The Haunted Castle! Knockout! Infraraid! Alarm Clock! Memory Check!

**ISSUE #26–FEB. '86 $4.00**
Windows! Build an auto-exec cartridge! Align your 1541! Survey of flight simulators! Structured programming! And ready to enter: Arena! Head to Head! Crabfight! Treasure Wheel! Character Dump!

**ISSUE #27–MAR. '86 $4.00**
Programming educational games! Memory dumpers! Choosing a copy program! Custom characters! And ready to enter: Ahoy! Term 128! Trivia Game Maker! Brickbusters! Easy Lister! Programmer's Aid!

**ISSUE #28–APR. '86 $4.00**
Comet catching! Survey of action and strategy games! Screen dumping! And ready to enter: Chrono-Wedge! Mr. Mysto! Air Rescue! Notemaker! Screen Window! JCALC! Hidden Cavern! Swoop!

**ISSUE #29–MAY '86 $4.00**
128 graphic bit map! Epyx strategy guide! 128 commands! ML music programming! And ready to enter: Bigprint! Star Search! Failsafe! English Darts! Ski Folly! Free RAM Check! Alchemist's Apprentice!

**ISSUE #30–JUNE '86 $4.00**
Debugging dilemmas! Public domain software! Winning at Ultima! Computer Aided Design! And ready to enter: LazyBASIC! Got A Match? Star Strike! Queen's and Bishop's Tours! Shaker! Trackdown!

**ISSUE #31–JULY '86 $4.00**
Inside the Amiga! Conditional branching! Chess programs! 128 and 64 DOS! And ready to enter: Screen Sleuth! Escape from Skull Castle! Head-On! Nebergall Run! Wordcount! Crazy Joe!

**ISSUE #32–AUG '86 $4.00**
Inside the Amiga, part II! Approaching infinity! C-64 war simulations! Pascal for beginners! And ready to enter: Reversi! Highlight! Disk Cataloger! Meteor Run! Trim! Step On It! Flap!

**ISSUE #33–SEP. '86 $4.00**
Windows and viewports! Sound & music on the 64! COMAL! And ready to enter: The Last Ninja! Speech64! Multi RAM! Dogcatcher! Trapped! Matchblocks! Variable Manager! Dual Dump!

**ISSUE #34–OCT. '86 $4.00**
Build a digital oscilloscope! ML speed techniques! And ready to enter: Vault of Terror! Quick Change! Penguins! Attack Force! Disk Checkup! Dvorak Keyboard! Mountaineer Mack! 128 Autoboot!

Use coupon or facsimile. If ordering more than three issues, list choices on separate sheet.

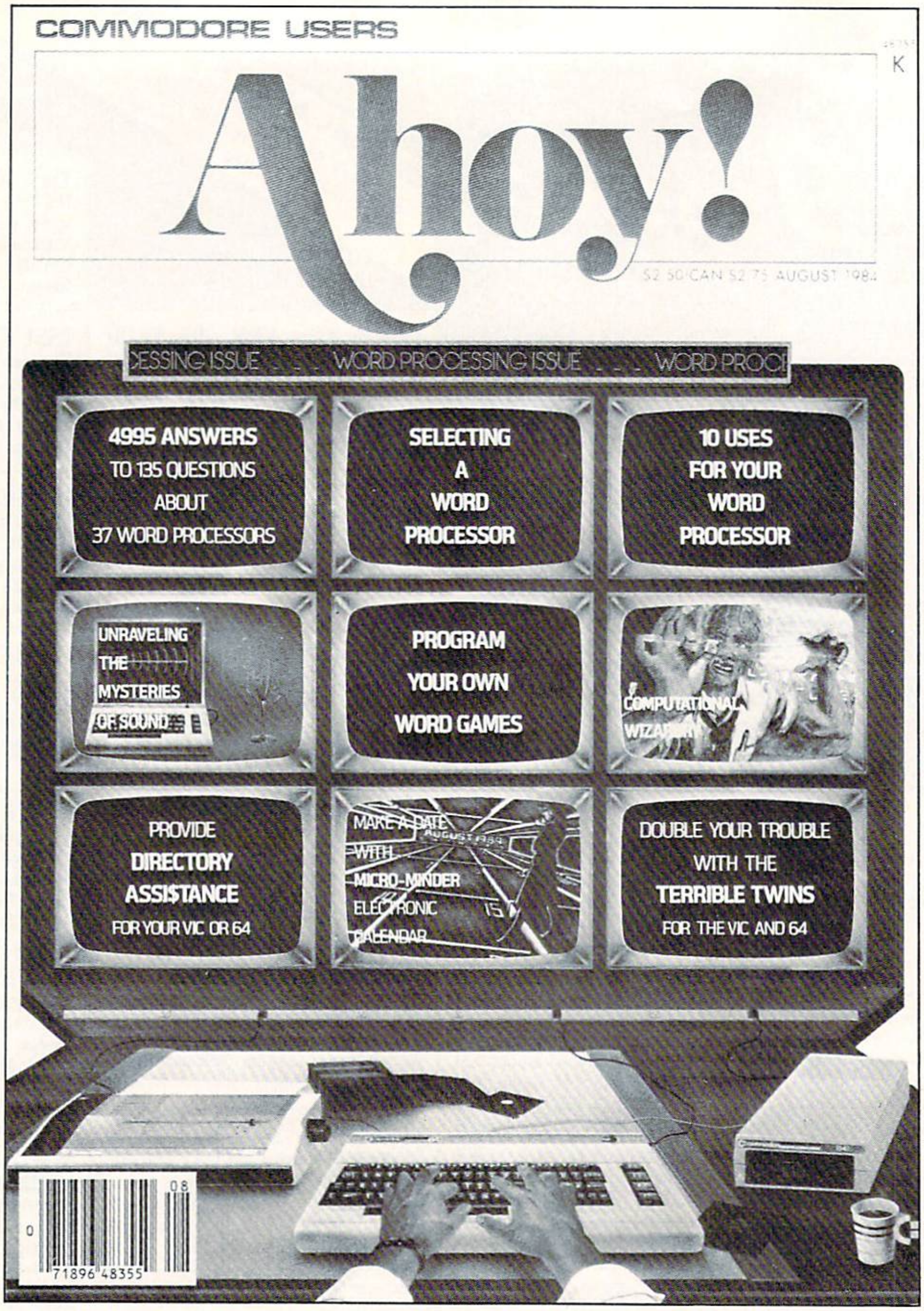
If you have a modem and want more complete information on any of the back issues listed, call *Ahoy!*'s Bulletin Board Service at 718-383-8909.

**Ahoy! BACK ISSUES**
ION INTERNATIONAL INC.
45 West 34th Street
Suite 407
New York, NY 10001

**Please Send Me The Following:**
______ Copies of issue number ______
______ Copies of issue number ______
______ Copies of issue number ______

**Enclosed Please Find My Check or Money Order for $__________**
(Outside the USA please add $1.00 for every copy)

NAME ______________________
ADDRESS ______________________
CITY ____________ STATE ____________ ZIP CODE ____________




# HAS EVERYTHING!

## SUBSCRIBE TO AHOY!

☐ Twelve Issues for $21.95 ($29.25 Canada and elsewhere)

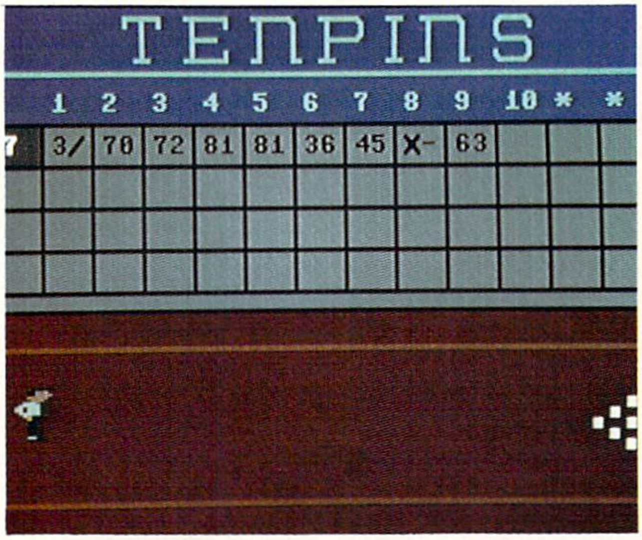
☐ Twenty-four Issues for $41.75 ($54.25 Canada and elsewhere)

Name____________________

Address____________________

City__________ State__________ Zip________

Send coupon or facsimile to:
ION INTERNATIONAL INC.
45 West 34th Street, Room 407, New York, NY 10001




# By Tony Brantner

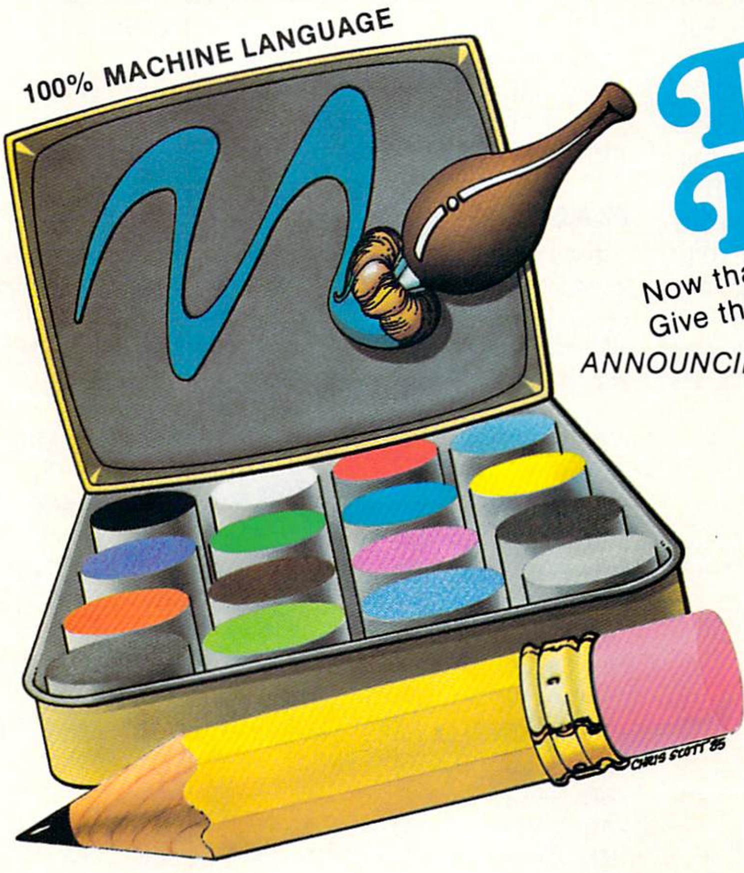
## Bowling Simulation for the C-64

*Tenpins* is a bowling simulation which offers the user something a bit different from most computer games. There is no time limit to worry about, no violent theme, and up to four people can participate. All you need is a single joystick, plugged into Port 2, which can be shared by all the players.

Moving the joystick up or down moves the bowler onscreen in that direction. Press the fire button when you are ready to release the ball. One advantage *Tenpins* has over most other bowling games is that you can "steer" the ball up or down after its release. Don't roll it to the sides of the alley, though, or you'll lose control. Your score is displayed on a scorecard above the alley, and your total, which is shown to the left of the scorecard, is updated after you finish your frame.

Scoring is just like in regular bowling, your total in each frame depending on what you roll. Knock down all ten pins in one roll (known as a strike), and you'll receive ten points plus the total of the next two rolls. Knock down the pins in two rolls (a spare), and you'll receive ten points plus the total of your next single roll. It should be noted that your score for that frame won't be totalled until you make the next roll(s). If any pins remain after two rolls (an open frame), then the number of those knocked down is added to your score. Rolling a strike in the tenth frame earns you two extra rolls, while a spare in that frame earns you one. □

*SEE PROGRAM LISTING ON PAGE 125*




Dot 'n Draw™

BUY NOW & SAVE

Now that the kids have their own computer...
Give them their own software...

$29.95

*ANNOUNCING* the **Easiest** Coloring Book Available!

- A delightful program for all ages; easy for kids and a challenge for adults.
- Draw your own pictures and save them on a disk.
- Color your own creations or any of the pre-drawn pictures included in this package.
- Coloring box with sixteen colors.
- Play Follow The Dots with your own pictures or those already on the disk.
- Play two levels of Follow The Dots: Easy, with a flashing dot leading the way, or more difficult, finding your own path through the dots.
- Printout your creations as line, dot, or hi-res screen dumps.

USES KEYBOARD, JOYSTICK, OR PADDLES

**TO ORDER SEND CHECK OR MONEY ORDER TO:**
**ILLUSTRATED IMAGES**
P.O. Box 25722, Portland, OR 97225

**FOR INFORMATION OR DEALER INQUIRIES CALL: (503) 246-2774**

Commodore 64/128 versions by Chris Scott
Apple version & concept by Don Fudge
All Rights Reserved Worldwide
**ALLOW 2 TO 3 WEEKS FOR DELIVERY**

Reader Service No. 198

# TIPS AHOY!

## Compiled by Michael R. Davila

Send your programming or hardware hints to *Tips Ahoy!*, Ion International Inc., 45 West 34th Street, Suite 407, New York, NY 10001. Generous premiums will be paid on acceptance.

### USING 128 COMMANDS IN 64 MODE

When developing Commodore programs to run in 64 or 128 mode, you sometimes cannot find a substitute for BASIC 7.0 commands. These keywords will not load or save correctly on a 64. They can, however, be embedded in PRINT statements and executed on a 128 using the dynamic keyboard technique. An example follows. It changes the 80 column screen color. This cannot be done with POKEs. —Edward Horgan
Coatesville, PA

```
•10 IFFRE(0)<>FRE(1)THENGOSUB1000
•20 END: REM PROGRAM STARTS HERE
•1000 PRINT"[CLEAR][4"[DOWN]"]COLOR6,2:CO
 NT[3"[UP]"]"
•1010 POKE842,13:POKE208,1:END:RETURN
```

### 20 PROGRAMMABLE FUNCTION KEYS

The 128 has the ability to perform a whole series of commands with the touch of a single function key. Two problems though: There are only eight keys, and the buffer for storing all key definitions is only 245 bytes.

The method below cures both annoyances by defining the function keys to call a subroutine appended to your program. When implemented, the routine checks location 211 to see if the SHIFT, COMMODORE, SHIFT/COMMODORE, or ALT keys are pressed. Depending on the combination, up to 20 separate routines or commands can be executed with a single stroke. The only limit on length is the amount of available RAM.
—Edward Horgan
Coatesville, PA

```
•10 KEY 1,"GOTO9000"+CHR$(13)
•20 KEY 2,"GOTO9000"+CHR$(13)
•100 REM SHIFT
•200 REM COMMODORE
•300 REM SHIFT & COMMODORE
•400 END:REM ALT
•9000 IFPEEK(211)=0 THEN LIST
•9010 IFPEEK(211)=1 THEN LIST-100
•9020 IFPEEK(211)=2 THEN LIST-200
•9030 IFPEEK(211)=3 THEN LIST-300
•9040 IFPEEK(211)=8 THEN LIST-400
•9050 END
```

### TWO FOR ONE

Hearing my computer constantly BEEPING and BUZZING to get my attention prompted this routine. The routine sounds a pleasant bell after printing "PRESS A KEY TO CONTINUE" on the screen.

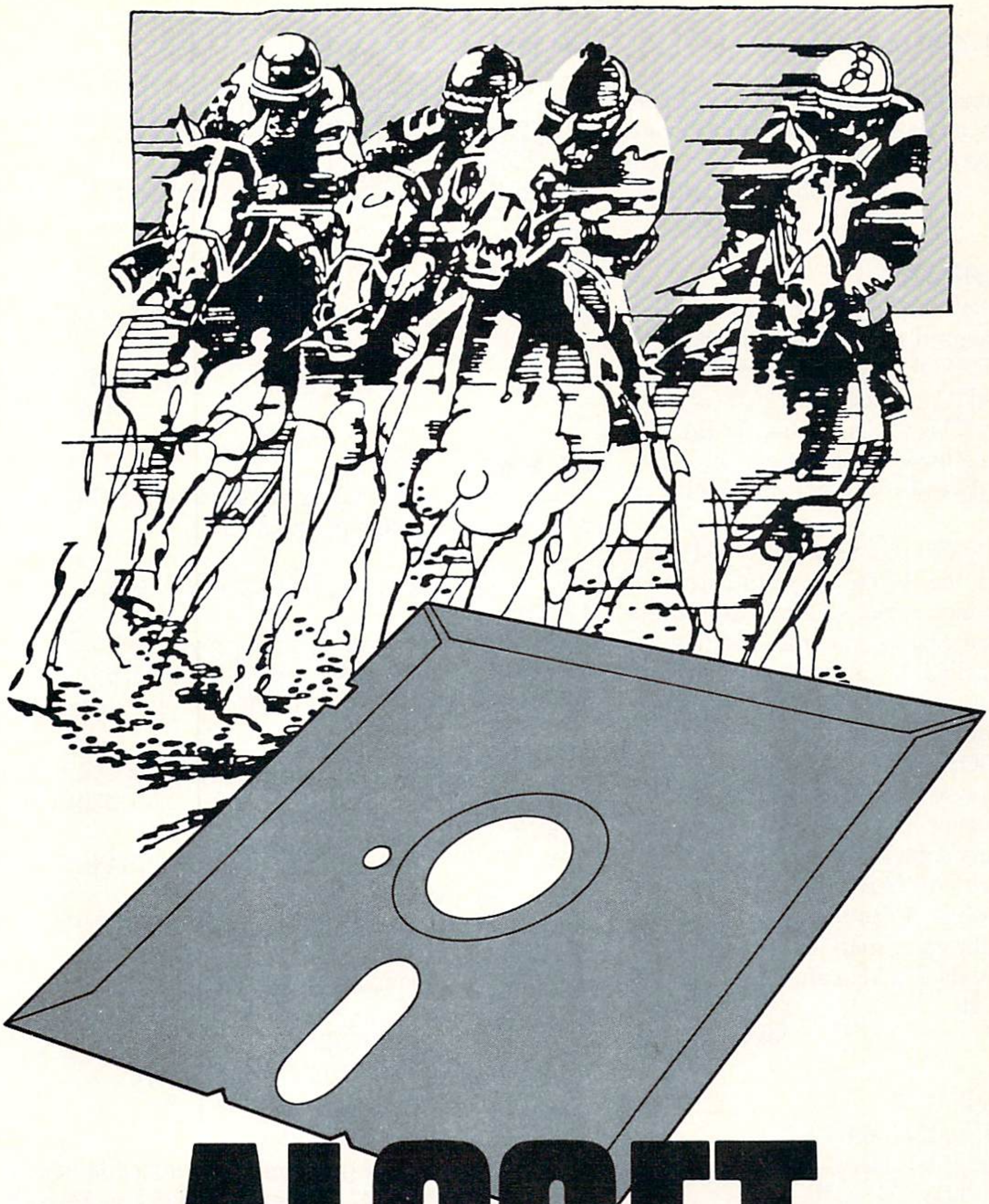
This was all well and good, but the "feature creature" (the little voice that keeps saying "yes, but wouldn't it be better if...") decided a simulated PRINT@ command, to control where the message printed, would be a good way to avoid destroying an aesthetic screen display. To position the cursor anywhere on the screen use line 1010. Note that by entering the KERNAL PLOT routine with SYS 58640 instead of SYS 58634, the routine will work regardless of the status of the carry flag. —Bob Ash
APO, NY

```
•10 REM ** TUNEFULL DELAY ROUTINE **
•20 ROW=24:COL=8
•30 GOSUB 1000
•40 END
•1000 REM ** SIMULATED PRINT-AT **
•1010 POKE214,ROW:POKE211,COL:SYS58640
•1020 REM ** DELAY ROUTINE **
•1030 PRINT"[RVSON] PRESS A KEY TO CONTIN
 UE "
•1040 REM ** RING BELL UNTIL KEYPRESS **
•1050 S=54272:POKES+24,15:POKES+1,112:POK
 ES,194: POKES+5,12:POKES+6,9
•1060 GETC$:IFC$="" THEN POKES+4,21:POKES
 +4,20:FOR T=1TO700:NEXT T:GOTO 1050
•1070 RETURN
```

### FLASHER

Here's a little ML routine you can use to brighten up those instructions, displays, or hi-scores. It only takes up 22 bytes, and is totally relocatable. Just change the address in line 10 to somewhere it doesn't interfere with your program and the operating system.

```
•0 SL=828:REM CHANGE SL TO STARTING ADDRE
 SS
•10 POKE 53281,0:POKE 53280,0:REM BACKGRO
 UND AND BORDER
•20 FOR X=SL TO SL+21:READC:POKEX,C:NEXT
•30 DATA 138,153,0,216,153,250,216,153,24
 4,217,153
•40 DATA 238,218,200,232,192,251,144,237,
 160,0,96
•50 PRINT"[CLEAR]":FOR X=1 TO 10:PRINT"TE
 ST[DOWN][DOWN]";:NEXT
•60 GETA$
•70 FOR T1=1 TO 40:NEXT T1:REM CHANGE 40
 TO MAKE FLASH FASTER OR SLOWER
•80 IF A$=""THEN SYS SL:GOTO 60
```



# Professional Harness,
## Thoroughbred and Greyhound Race Analyzers with unparalleled features:

- Five minutes of typing replaces two hours of tedious hand calculations needed per race for these unique handicapping systems.
- Morning Line odds are not considered. This enables the program to generate unbiased ratings for each race entrant, and also increases the probability of Race Analysis accurately predicting "longshot" winners.
- After all races have been handicapped (20 races max), Race Analysis will list (to screen, printer or disk) complete ratings for all entrants. In addition, the program will suggest "Best Bets", including: three best win bets, three best quinellas, best perfecta (exacta) and trifecta, and three best trifecta boxes.

*All Alsoft Race Analysis Systems include the MASTER ANALYSIS DEVELOPMENT PACKAGE. With the assistance of this powerful program, handicappers are able to easily build, develop, and fine tune computerized handicapping systems for all types of sporting events. A Pro Football handicapping module is included on the program disk.*

# ALSOFT™

## RACE ANALYSIS SYSTEMS

**Program works only on a Commodore 64™ and 128.™**

| | |
|---|---|
| 3-PACK (Harness, Thoro, & Greyhound) ....... | $69.95 |
| 2-PACK (Choose two from above) ............ | $59.95 |
| 1-PACK (Choose one from above) ............ | $39.95 |

**30 DAY MONEY BACK GUARANTEE**

*To Order:* Ask your local retailer or call (412) 233-4659 for MasterCard & Visa orders. To order by mail, send check or money order to ALSOFT, 305 Large Avenue, Clairton, PA 15025. Prices listed include shipping and handling. All orders are shipped within 24 hours of receipt. Dealers please contact JS Distributing, 843 Lindenwood, Pittsburgh, PA 15234, Phone (412) 343-8756, 24 Hour BBS (412) 343-7585.

**Reader Service No. 156**

```
•90 PRINT"[CLEAR][DOWN]BACK TO NORMAL"
```

To me a black background and border looks best. After selection is made, just clear the screen and continue with program. I hope you can use this in some of your programs. —Robert M. Hickey
APO, SF

### VARTAB CALCULATOR

Programmers who often load machine language programs may have experienced more than their share of OUT OF MEMORY ERROR's. This is caused by the fact that the end of BASIC pointer (VARTAB) is used as an index during loads. This works just fine for BASIC, but after a non-relocating load, this pointer is moved to point to the end of the data that was loaded, whether it was BASIC or not.

Below is a short utility that will recalculate VARTAB by counting the bytes in the BASIC program currently in memory. It is 100% relocatable, so it may be moved from location 679 by changing the variable L on line 10. Wherever it is located, SYS 2 will always activate it.

To demonstrate its use, suppose you are writing a BASIC program and decide that you need the DOS wedge, so you LOAD"DOS 5.1",8,1 and SYS 52224. Now almost anything you do will cause an OUT OF MEMORY ERROR. Simply enter SYS 2 and the program is left intact and the pointers point to the right places. This program will also restore VARTAB if it has been altered in some other way. A word of caution, though. It will truncate anything after the zeros marking the end of the BASIC program, so any data hidden after the program will be lost if it is saved. —Danny Faught
Sherman, TX

```
•1 REM VARTAB CALCULATOR
•2 REM DESIGNED BY DANNY FAUGHT
•10 L=679:HI=INT(L/256):LO=L-HI*256
•20 POKE2,76:POKE3,LO:POKE4,HI
•30 FORX=LTOL+52:READA:POKEX,A:CK=CK+A:NE
 XT
•40 IFCK<>6541THENPRINT"[DOWN]DATA ERROR
 - RECHECK DATA STATEMENTS":END
•50 PRINT"[8" "]VARTAB CALCULATOR READY":
 PRINTTAB(11)"SYS 2 TO ACTIVATE"
•100 DATA 165,43,133,45,165,44,133,46,160
 ,0,177,45,240,7,200,208,249,230,46,208
•110 DATA 245,200,177,45,208,240,200,177,
 45,208,235,200,152,24
•120 DATA 101,45,133,45,133,47,133,49,165
 ,46,105,0,133,46,133,48,133,50,96
```

### 64 MEMORY REMINDER

When I'm working with a large program with a lot of string data, I want to be careful not to run out of memory. During program development, I keep a menu option to end the program. At the end of the exit routine, I insert the following lines to let me know how I'm doing with memory consumption:

```
Y = PEEK(52)*256 + PEEK(51)
PRINT "BOTTOM OF STRING STORAGE: ";Y
Z = PEEK(50)*256 + PEEK(49)
PRINT "      END OF ARRAY SPACE: ";Z
PRINT "
--"
X = Y - Z
PRINT "   REMAINING FREE MEMORY: ";X
```

—Thomas P. Shultz
Clarion, PA

### E-Z DATA

Entering tons of DATA statements on the C-128 is a snap if you RUN this program first:

```
•10 IF DS$ THEN FAST: GOTO30: REM CHECK C
 OMPUTER TYPE
•20 PRINT"COMMODORE 128 REQUIRED.":END
•30 FOR X=1TO8:KEYX,"DATA":NEXT:REM NOW A
 NY FUNCTION KEY WILL PRINT THE WORD 'DAT
 A'
•40 FOR X=0TO88:POKE6912+X,PEEK(64128+X):
 NEXT:REM COPY ROM KEYBOARD DECODER TABLE
  INTO RAM
•50 POKE 830,0:POKE831,27:REM CHANGE POIN
 TERS TO RAM
•60 POKE 6994,44:REM CHANGE PERIOD TO A C
 OMMA
•70 FOR X=842TO847:READ B$:POKEX,ASC(B$):
 NEXT:POKE848,13:POKE208,7:REM ACTIVATE A
 UTO LINE NUMBERING
•80 DATA "A","U","T","O","1","0"
•90 SLOW
```

What we've done is program all the function keys to print the word "DATA", changed the numeric keypad's period to a comma, and activated the 128's line-numbering utility (instead of 10—the "1" and "0" in line 80—use whatever increment matches the program you are entering). Now you can type entire DATA statements with one hand, leaving the other hand free to keep your place in the *Ahoy!* listing.

Important: If you own an international model 128 (it has an ASCII-DIN key instead of a CAPS-LOCK key) you must add:

```
45 POKE 2757,PEEK(2757) OR 128: REM DISA
BLE POINTER RESET
```

—Bert Halverson
Joplin, MO

### BASIC HIDER

If you ever wanted to hide a BASIC program from prying eyes, this short machine language program will do it.

# ABBY'S DISCOUNT SOFTWARE

## INTRODUCING

### NINTENDO ENTERTAINMENT SYSTEM

DELUXE SET — Includes Control Deck, 2 Controllers, R.O.B. (Video Robot), Zapper (Light Gun), 2 Game Paks - Gyromite & Duck Hunt $149.00

CONTROL DECK — Includes Control Deck, 2 Controllers, Super Mario Bros. Game Pak .......... $89.00

**ACCESSORIES**

R.O.B. (Video Robot) ...... $42.00
Zapper (Light Gun) ....... $24.00

**GAME PAKS**

Robot Series ......... ea. $32.00
Light Gun Series ...... ea. $28.00
Programmable Series .. ea. $28.00
Sports Series ......... ea. $24.00
Action Series .......... ea. $24.00
Education Series ...... ea. $19.00
Arcade Classics ....... ea. $19.00

### WORLDS OF WONDER LAZER TAG

LAZER TAG GAME KIT — Includes Star Lyte (Hand Unit), Star Belt & Star Sensor ................ $45.00

**ACCESSORIES**

Lazer Tag Star Vest ....... $18.00
Lazer Tag Star Sensor ..... $20.00
Lazer Tag Star Band ...... $ 9.00
Lazer Tag Star Helmet .... $36.00
Lazer Tag Star Cap ....... $20.00

### ANIMATED TALKING TOYS

Teddy Ruxpin ............... $65.00
Grubby ..................... $49.00
Mother Goose ............... $65.00
Snoopy ..................... $75.00
Charlie Brown .............. $49.00
Woodstock .................. CALL
Poseable Miniatures ..... as low as $ 2.50

**ACCESSORIES**

Hand Puppets ......... as low as $12.00
Books & Tapes ........ as low as $ 9.75
Clothing (for talking toys) ...... as low as $10.50

## TOP HITS

### AMIGA SOFTWARE

Leader Board Golf ...... $ 29
Little Computer People .. $ 29
Music Studio .......... $ 29
Deluxe Paint ........... $ 72
Art Disk Vol. I ........ $ 24
Deluxe Print ........... $ 72
Art Disk Vol. II ....... $ 24
Deluxe Video .......... $ 72
Instant Music .......... $ 39
Marble Madness ........ $ 32
Winter Games .......... $ 32
Hitchhiker's Guide To The Galaxy .......... $ 32
Lattice C Compiler ...... $119
A-Copier .............. $ 32
Silent Service ......... $ 32
3-D Graphics Library .... $ 39
VIP Professional ........ $159
Marauder ............. $ 32
Grabbit ............... $ 24
Amiga Macro Assembler . $ 79
Amiga Pascal .......... $ 79
Amiga LISP ........... $159
AEgis Animator ........ $109
AEgis Draw ............ $159
Typing Tutor/Word Invaders ............ $ 27

**HARDWARE**

256K Color Amiga System ............ CALL
256K Amiga ........... CALL
A1010 3½" Disk Drive .. CALL
A1080 Color Monitor ... CALL
A1050 256K Expansion .. CALL

### C64/128 SOFTWARE

All ABACUS Titles ..... CALL
All MASTERTRONICS Titles .............. CALL
World Karate Championship ......... $29
Winter Games .......... $26
The Toy Shop .......... $45
Gettysburg: The Turning Point ..... $45
10th Frame ............ $29
World Games ........... $29
Road War 2000 ......... $29
Gemstone Healer ....... $29
Destroyer ............. $29
Shard of Spring ........ $29
Hardball .............. $25
Commando ............. $25
Gunship .............. $25
Fontmaster II .......... $32
GEOS ................. $49
F-15 Strike Eagle ....... $25
Fast Hack'em .......... $29
Merlin 64/128 .......... $39
Copy II 64/128 ......... $39
Newsroom ............. $39
Print Shop ............. $35
Print Shop Companion .... $28
Print Master ........... $27

**HARDWARE**

D 64 C Computer ...... CALL
D 1541 C Disk Drive .... CALL
C-128 Computer ....... CALL
VIC-1571 Disk Drive .... CALL
VIC-1581 Disk Drive .... CALL

## RIBBONS

Commodore - 1525 .... $ 7.50
Commodore - 1526/802 $ 7.00
Commodore - MPS-801 $ 7.50
Commodore - MPS-803 $ 9.00
Epson MX/RX/FX - 80 .. $ 5.00
Okimate 10 - Color .... $ 6.00
Star Powertype ....... $ 6.00
SG-10 Black .......... $ 2.50
SG-10 Color - Please State Choice of Color .... $ 3.50

## DUST COVERS

Amiga System Pack ... $29.00
Amiga 1010 Disk Drive . $ 8.00
C-128 Computer ...... $ 8.00
1541 Disk Drive ....... $ 7.00
1571 Disk Drive ....... $ 8.00
1702 Monitor ......... $10.00
VIC 20/64 Computer ... $ 7.00

## PRINTERS

**Others Available - Please Call**

Star Micronics LV-1210 .. $179
Star Micronics NL-10 .... $229
Star Micronics NX-10 .... $239
Star Micronics SG-10C .. $229
Star Micronics SG-15 .... $369
Star Micronics SR-15 .... $599
Epson - FX-85 .......... $399
Panasonic - 1091 ....... $259

*CALL ON THESE AND OTHER PRODUCTS. WE CARRY A COMPLETE LINE OF SOFTWARE AND HARDWARE*

## CHRISTMAS SPECIALS

### MINDSCAPE

**(Educational - Age 4 to 8)**

Tink's Adventure ....... $6.95
Tuk Goes to Town ..... $6.95
Tinka's Mazes ......... $6.95
Tonk in the Land of The Buddy Bots ..... $6.95

**(Age 8 to 12)**

Mr. Pixel's Paint Set .... $9.95
Mr. Pixel's Cartoon Kit .. $9.95
Show Director ......... $9.95

### DATASOFT

O'Riley Mine .......... $5.95
Dallas Quest .......... $5.95
Mancopter ............ $5.95

### TIMEWORKS

Money Manager (D&C) .. $5.95
Electronic Checkbook (D&C) .... $5.95
Data Manager (D&C) ... $5.95

### COMMODORE

Suspended .......... $ 9.00
Star Ranger .......... $ 3.00
Music Composer ...... $ 3.00
English III ........... $ 1.50
English V ............ $ 1.50
English VII .......... $ 1.50
Math V .............. $ 1.50
Accounts Payable ..... $10.00
Payroll/Check Writing ........... $10.00

**ALL TITLES ON DISK UNLESS MARKED (R) FOR ROM CARTRIDGE**

**WE CHECK FOR STOLEN VISA & MASTERCARD**

**Order Line**
**1-800-282-0333**
**ORDERS ONLY! Sales Personnel Do Not Have Information on Previous Orders or Product Specs.**

**M-F 10 a.m.-8 p.m.; Sat. 10-3 ET**

**37 S. Broad Street, Fairborn, OH 45324**

**Customer Service & Ohio Residents**
**1-513-879-9699**

AD #AH-116

VISA

SOFTWARE ONLY — Prepaid orders over $50 receive free shipping via UPS in continental U.S. Please add $2 orders under $50. HARDWARE and all orders requiring shipment via U.S. Post Office are subject to additional freight charges. Add $5 for COD orders. VISA/MasterCard orders add $2 service charge. Ohio residents add 5.5% sales tax. Personal checks require a three-week waiting period. No waiting when paid by credit card, certified check or money order. All items subject to availability and price change. PLEASE CITE AD NUMBER WHEN ORDERING. ALL RETURNS MUST BE ACCOMPANIED BY AN AUTHORIZATION NUMBER.

MasterCard

Reader Service No. 157

# LYCO COMPUTER

*Marketing & Consultants, Inc.*

**America's Mail Order Headquarters!**

## *NEW HOURS*

Mon-Thur—9AM-8PM
Fri—9AM-6PM
Sat—10AM-6PM

### COMMODORE

| | |
|---|---|
| 1571 | CALL |
| C-64 | CALL |
| 1541 | CALL |
| 128 | CALL |
| C 1902-A | CALL |
| C 1350 Mouse | 39 |
| C 1700 128 K RAM | 145 |
| C 1750 512 K RAM | 269 |
| Jane | 35 |
| GEOS | CALL |
| Perfect Writer | 45.95 |
| Perfect Calc | 45.95 |
| Perfect Filer | 45.95 |

### EPYX-64

| | |
|---|---|
| Movie Monster | 24.75 |
| Vorpol Kit | 22.75 |
| Fast Load | 24.75 |
| Summer Game II | 24.75 |
| Super cycle | 24.75 |
| World games | 24.75 |
| Football | 24.75 |

### XETEC

| | |
|---|---|
| Font Master II 64 | 32.95 |

### COMMODORE

| | |
|---|---|
| 1571 | CALL |
| 1541 | CALL |

### SPRINGBOARD
(C-64)

| | |
|---|---|
| Newsroom | 32.75 |
| Clip Art 1 | 18.75 |
| Clip Art 2 | 24.75 |

### HI TECH

| | |
|---|---|
| Cardware | 8.95 |
| Partyware | 8.95 |
| Heartware | 8.95 |
| War With All | 12.95 |
| Holiday Paper | 8.95 |

### ACTIVISION

| | |
|---|---|
| Alter ego | 28.75 |
| Hacker | 18.75 |
| Little People | 20.75 |
| Game Maker | 24.75 |
| Borrowed Time | 18.75 |
| Space shuttle | 18.75 |
| Music studio | 22.75 |
| Mind shadow | 18.75 |
| Road Race | 18.75 |
| Fast Tracks | 22.75 |
| Count down | 18.75 |
| Basketball | 18.75 |

### FIREBIRD
(C-64)

| | |
|---|---|
| Elite | 22.75 |
| Tracker | 28.75 |
| The Pawn | CALL |

### MICROLEAGUE

| | |
|---|---|
| ML Baseball | 24.95 |
| General Manager | 24.95 |
| 85 team disk | 14.95 |
| Franchise | 19.95 |
| Stat Disk | 16.95 |

### BRODERBUND

| | |
|---|---|
| Print Shop | 24.75 |
| Graphics Lib I, II, III | 15.75 |
| Karateka | 17.75 |

### BATTERIES INCLUDED

| | |
|---|---|
| Consultant | 32.95 |
| Paperclip w/spell pk | 48.95 |

### COMMODORE

| | |
|---|---|
| 1902 color | CALL |
| 1802 | CALL |

### ACCESS
(C-64, Amiga)

| | |
|---|---|
| Leader board | 24.75 |
| Leader board Amiga | 24.75 |

**TOLL FREE 1—800—233—8760**

### TIMEWORKS
(C-64)

| | |
|---|---|
| Data Manager-128 | 42.95 |
| Swiftcalc-128 | 42.95 |
| Wordwriter-128 | 42.95 |
| A/Payable-128 | 38.95 |
| A/receivable-128 | 38.95 |
| General Ledger-128 | 38.95 |
| Inventory-128 | 38.95 |
| Payroll-128 | 38.95 |

### SUB LOGIC

| | |
|---|---|
| Flight Simulator | 29.95 |
| Jet Simulator | 29.95 |
| Football | 25.95 |
| Scenery Disk . . . EA | 14.95 |
| Set 1-6 | 69.95 |

### ACTIVISION
(Amiga)

| | |
|---|---|
| Hacker | 26.75 |
| Mind shadow | 26.75 |
| Music studio | 34.75 |
| Borrowed Time | 26.75 |

### INNOVATIVE CONCEPTS

| | |
|---|---|
| Flip-N-File 10 | 2.49 |
| Flip-N-File 25 Lock | 10.95 |
| Flip-N-File 50 Mini | 10.95 |
| Flip-N-File 50 Lock | 15.95 |
| Flip-N-File ROM | 7.99 |

### REDIFORM PAPER

| | |
|---|---|
| Qty 1000 9½x11 white lazer | 19.95 |
| Qty 200 9½x11 white lazer | 5.95 |
| Qty 3000 9½x11 white | 29.95 |
| Qty 1000 9½x11 white | 16.95 |
| Qty 1000 Mailing labels 1x3 | 6.95 |

*JOYSTICKS FROM WICO & SUNCOM*

| | |
|---|---|
| Bat Handle | 16.75 |
| Boss | 11.99 |
| Super 3-way | 19.99 |
| TAC 3 | 9.95 |
| Slik stik | 6.95 |
| Economy | 5.95 |

## *DUST COVERS*

**Atari**

| | |
|---|---|
| 520ST | 11.95 |
| 130XE | 6.99 |
| 800XL | 6.99 |
| 1050 | 6.99 |
| 1025 | 7.99 |

**Commodore**

| | |
|---|---|
| C128 | 7.99 |
| 1571/1541 | 6.99 |
| 1902 | 10.95 |
| 1702 | 8.99 |
| C64/Vic20 | 6.99 |

**Panasonic**

| | |
|---|---|
| 1090/1091 | 8.99 |
| 1092 | 8.99 |
| 1093 | 9.99 |

### XETEC

| | |
|---|---|
| Super Graphix 64 | 64 |
| Super Graphix Jr 64 | 45 |
| Xetec AT | 39.95 |

DISK DRIVE CLEANING KIT
**$8.95**

With Software
**$17.95**

**NAME BRAND VIDEO TAPES**
from
**$4.49**
Qty. Discounts Available

"WE MAKE YOUR COMPUTER FUN TO USE!"

*Buy Lyco and Enjoy*

★ THE LOWEST PRICES ★ TOLL FREE ORDER LINE ★

★ Free shipping on prepaid cash orders in U.S. ★ All Merchandise Factory Fresh ★ Fast Service from one of the oldest and most established Computer Supplier ★ 24 hrs. shipping on in-stock product ★ Access to our Multi Million $ inventory ★ No deposit on UPS C.O.D. orders ★ Orders outside PA Save state sales tax ★ Air freight service available ★ Full Manufacturer's Warranty apply! ★ Full accessory line in stock ★ Purchase orders Accepted from educational institutions! ★ We check for stolen credit cards! ★ We ship to our servicemen overseas! ★ You'll love our Courteous Sales Staff! ★ We satisfy more customers monthly than most of our competitors combined ★

# LYCO COMPUTER

*Marketing & Consultants Inc.*

**America's Mail Order Headquarters**



### PANASONIC
1080 ........ 195
1091 ........ 225
3131 ........ 249
1092 ........ 309
1592 ........ 419
1595 ........ 595

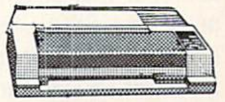
### DIABLO
D25 ........ 549
P-32 CQ1 ........ 699
635 ........ 1029
P-38 ........ 1749
D-80 1F ........ 2395

### BROTHER
HR-15XL-P ........ 359
1509 ........ 409

### SEIKOSHA
SP-1000 VC (C-64) ........ 165
SP-1000 A Centronics ........ 185
SP-1000 IBM ........ 185
SP-1000 As Rs-232 ........ 185
SP-1000 AP, APIIc ........ 185
BP-1300 ........ 469
BP-5200 ........ 649
BP-5420 ........ 999
Color Kit ........ 119
BP-5420 ribbon ........ 12.50
SP-1000 ribbon ........ 8.50

### JUKI
Juki 6100 ........ CALL
RS-232 Serial board ........ 55
6100 tractor ........ 119
6100 sheet feeder ........ 209
5510 Juki ........ CALL
Juki 6300 ........ CALL

### LEGEND
808 ........ 148
1080 ........ 199
1380 ........ 229
1385 ........ 289



### OKIDATA
Okimate ........ 199
292 ........ 499
293 ........ 599
120 NLQ ........ 205
182 ........ 214
192 ........ 348
93 ........ CALL

*1080 ........ $195*

## SAVE ON THESE IN STOCK PRINTERS

*NX-10 ........ CALL*

### TOSHIBA
321 P/S ........ 495
351 sheet feeder ........ 529
P 341P ........ 969
P 341S ........ 999
P 351+ ........ 1149

### SILVER REED
EXP 420P ........ 209
EXP 600P ........ 489
EXP 800P ........ 649
EXP 770 ........ 740

### CITIZEN
120-D ........ 179
MSP-10 ........ 285
MSP-15 ........ 385
MSP-20 ........ 325
MSP-25 ........ 485
Premier 35 ........ 469

### EPSON
LX80 ........ CALL
FX85 ........ CALL
DX10 ........ CALL
DX20 ........ CALL
DX35 ........ CALL
HI80 ........ CALL
HS80 ........ CALL
FX286 ........ CALL
LQ800 ........ CALL
LQ1000 ........ CALL

### C. ITOH
1550 SP+ ........ CALL
D 1040 ........ CALL
Prowriter Jr ........ CALL
Prowriter 8510 SP+ CALL

### STAR MICRONICS
LV 12-10 (New) ........ CALL
NL-10 ........ CALL
NX-10 ........ CALL
NB-15 ........ CALL
SB-15 ........ CALL
SG-15 ........ 367
SD-10 ........ 319
SD-15 ........ 438
SR-10 ........ 469
SR-15 ........ 578
SB-10 ........ 589

## *MONITORS*

### PANASONIC
TR-122 MYP 12″ Amber TTL 139
TR-122 M9P 12″ Green TTL . 139
TX-12H3P 12″ RGB ........ 369
DT-H103 10″ RGB ........ 349

### NEC
Multisync ........ CALL

### TEKNIKA
MJ-22 ........ 249
MS-305 RGB ........ 309

### ZENITH
ZVM 1220 ........ 89
ZVM 1230 ........ 89
ZVM 1240 ........ 149

### THOMPSON
365 12 RGB ........ CALL

### HITACHI
MM-1218 12″ Green ........ 99
MM-1220 12″ TTL Amber . 129
CM-1406C 13″ color w/cable ........ 179
CM-1409 13″ RGB ........ 305
CM-1216 D 12″ RGB ........ 385
CM-1455 S 13″ 720x350 . . 525
CM-1457 A 13″ RGB 720x460 ........ 679

### PRINCETON GRAPHICS
MAX-12 Amber ........ 175
HX-12 RGB ........ 458
SR-12 RGB ........ 575

## *INTERFACING*

### XETEC
Super Graphix 64 ........ 64
Super Graphix SR 64 ........ 45

### TYMAC
Connection (C-64) ........ 49

### ORANGE MICRO
Grappler CD (C-64) ........ 79

### PPI
C-64 ........ 49

## *DISKETTES*

### 5¼″ DISKETTES
**MAXELL**
SSDD ........ 9.99
DSDD ........ 12.99

**BONUS**
SSDD ........ 6.99
DSDD ........ 7.50

**SKC**
SSDD ........ 8.50
DSDD ........ 9.50
DSHD 96 TPI ........ 19.50



### 3.5 DISKETTES
**3M**
SSDD ........ 16.99
DSDD ........ 23.99

**MAXELL**
SSDD ........ 16.99
DSDD ........ 23.99

**VERBATIM**
SSDD ........ 16.99
DSDD ........ 24.99

## *DRIVES*

### COMMODORE
1571, 1541 ........ CALL

### COMTEL
Enhancer 2000 (C-64) . . 149

### INDUS
GT Commodore ........ 179

## *MODEMS*

### SUPRA
1064 Modem (C-64) . 49.95
Supra 300 ........ 39.95
Supra 1200 ........ 149.95

***COMPUSERVE . . 18.95***

### COMMODORE
1670 ........ 155

### DSI
Messenger 64/128 . . 39.95

## TOLL FREE 1-800-233-8760

In PA **717-494-1030**

**Customer Service 717-494-1670**

**or send order to**
**Lyco Computer**
**P.O. Box 5088**
**Jersey Shore, PA**
**17740**

### RISK FREE POLICY

In stock items shipped within 24 hours of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO. FPO. and international orders add $5.00 plus 3% for priority mail service. Advertised prices show 4% discount for cash, add 4% for MasterCard and Visa. Personal checks require 4 weeks clearance before shipping. We do not guarantee compatibility. We only ship factory fresh merchandise. Ask about UPS Blue and Red label shipping. All merchandise carried under manufacturer's warranty. Return restriction applicable. Return authorization required. All items subject to change without notice.

When it is run, your specially prepared program will be made invisible to the C-64 LIST command and consequently also to all but the most determined of the curious.

Type in the program below, save a copy, and run it. This installs the routine into memory. Now load the program you wish to hide. This source program must be prepared in the following way before activating the *Hider* or it will be ruined: Using the insert mode, add exactly five colons between the line number and the first command. A space after the line number is okay, but no other spaces can appear between the first colon and the first command. These colons must be added to each and every line. To illustrate, the program

```
10 PRINT"HELLO"
20 GOTO 10
```

would be changed to

```
10 :::::PRINT"HELLO"
20 :::::GOTO 10
```

When the program is ready, type SYS 49152 in the direct mode. Not much seems to happen, but type LIST and see! Your new program can be saved and loaded like any other BASIC program, but studying or modifying it is a bear.

—Paul Sobolik
Pittsburgh, PA

```
·100 ML=49152:PRINT"[CLEAR][DOWN]REMEMBER
 : PREPARE BASIC PROGRAM TO BE"
·110 PRINT"HIDDEN PRIOR TO ACTIIVATING BA
 SIC HIDER"
·120 FORX=0TO66:READA:POKEML+X,A:CK=CK+A:
 NEXT
·130 IFCK<>8519THENPRINT"ERROR IN DATA ST
 ATEMENTS":END
·140 PRINT"[DOWN]SYS49152 TO ACTIVATE"
·150 DATA 169,1,133,251,169,8,133,252
·160 DATA 160,0,177,251,240,45,153,253
·170 DATA 0,200,192,2,208,244,32,45,192
·180 DATA 160,0,177,253,240,32,153,251
·190 DATA 0,200,192,2,208,244,32,52,192
·200 DATA 32,8,192,160,4,169,0,145,251
·210 DATA 96,160,4,169,0,145,253,96,32
·220 DATA 45,192,96,32,52,192,96
```

## PRINTING THE LAST LINE

Below is a routine I developed for printing menus on the last line of the screen. Lines 35 and 70 offer two methods of printing text at the bottom right-hand corner of the screen without a carriage return. CHR$(148) (line 35) is the INSERT character which shows as a reversed T (line 70) when used inside quotes. Also utilized in this routine is the WAIT 198,1 function, which waits for a key to be pressed. Lines 50-60 position the cursor at a specific screen location (JJ is row#, KK is column #).

—Steven G. Eason
Wichita, KS

```
·5 POKE53281,0:POKE53280,0
·10 JJ=22:KK=0:GOSUB50:PRINT"[RVSON][RED]
 PRESS ANY KEY TO CONT[c +][3" "]";
·20 PRINT"[RVSON][RED]SYST STATUS [BLUE]O
 K ";
·30 PRINT"[RVSON][GREEN]  F1 [s B]  F2 [s
  B]  F3 [s B]  F4 [s B]  F5/F7 [s B] CRS
 R";CHR$(94)CHR$(32);
·35 PRINT"[RVSON]MAIN [s B] SUB [s B]SC.P
 R[s B]HR.PR[s B]H/L TOG [s B]SCROLL[6"[L
 EFT]"]"CHR$(148)" ";
·40 WAIT198,1:GETG$:IFG$=""THEN40
·41 STOP
·42 REM ****************
·43 REM PRINT AT ROUTINE
·44 REM ****************
·50 PRINT"[HOME]";
·55 IFJJ<>0THEN POKE214,JJ-1:PRINT
·60 POKE 211,KK:RETURN
·65 REM *********
·66 REM ALTERNATE
·67 REM *********
·70 PRINT"[RVSON]MAIN [s B] SUB [s B]SC.P
 R[s B]HR.PR[s B]H/L TOG [s B]SCROL [LEFT
 ]L";
```

## REMFIX

If your renumber utility scans instead of skipping past the text of REM statements, you can make it "fix" any line numbers referred to in explanatory REMs simply by POKEing a GOTO token into an otherwise blank space preceding the target number. Put the text of the REM statement inside quotes to prevent the LIST command from expanding the token. Example:

```
299 H7=PEEK(61)+256*PEEK(62):POKE(PEEK(H
7+1)+256*PEEK(H7+2)+11),137
300 REM "LINE 470 CALCULATES FREQUENCY N
UMBER FOR VOICE ONE"
301 STOP
```

In the example, Line 300 is a permanent program line. Lines 299 and 301 are temporary and should be deleted after doing RUN 299. A renumber utility will now treat the number 470 in Line 300 exactly the same as any other GOTO destination line number. Note the important number 11 near the end of Line 299. It is a sort of index number that represents the location of the blank space, and may be different each time you use the procedure. You must make it equal to the number of characters that follow REM, over to and including the blank space, plus four. If your REM statement holds several line numbers to be fixed, simply make sure each is preceded by a blank space, change the index number in Line 299, and RUN

# FREE!

BONUS GIFT WITH ANY SOFTWARE ORDER — AN EXCELLENT PUBLIC DOMAIN VERSION OF AN ARCADE HIT GAME ON ITS OWN DISK.

## ARCADE

| | |
|---|---|
| A.C.E. | $14.95 |
| Bop and Wrestle | 19.95 |
| Commando | 23.95 |
| Dambusters | 19.95 |
| Elite | 19.95 |
| Fight Night | 19.95 |
| Flight Simulator II | 32.95 |
| Scenery Disks (Set of Six) | 75.95 |
| Star Scenery Disks | 16.95 |
| GBA Two on Two Basketball | 23.95 |
| Gary Kitchen's Game Maker | 26.95 |
| Great American Road Race | 19.95 |
| Hardball | 19.95 |
| Leader Board | 26.95 |
| MicroLeague Baseball | 26.95 |
| 1984 or 1985 team disk | 13.95 |
| World Series or All Star disk | 13.95 |
| General Manager's disk | 26.95 |
| Box Scores/Stat Disk | 16.95 |
| Racing Destruction Set | 12.95 |
| Spitfire 40 | 23.95 |
| Star Rank Boxing | 21.95 |
| Superbowl Sunday | 20.95 |
| 1984 & 1985 Data Disks | 13.95 |
| Super Cycle | 26.95 |
| World Karate Championship | 21.95 |

## ADVENTURE AND MIND GAMES

| | |
|---|---|
| Alter Ego (Male or Female) | $33.95 |
| Astrology Horoscope Maker | 15.95 |
| Bard's Tale | 25.95 |
| Battlefront | 26.95 |
| Chessmaster 2000 | 28.95 |
| Hacker II | 21.95 |
| Heart Of Africa | 12.95 |
| Hitchhiker's Guide | 24.95 |
| Lords of Conquest | 26.95 |
| Modern Computer People | 23.95 |
| Movie Maker | 25.95 |
| Nato Commander | 24.95 |
| Phantasie (or Phantasie II) | 26.95 |
| Rings of Zelfin | 24.95 |
| Seven Cities Of Gold | 12.95 |
| Strip Poker | 20.95 |
| Ultimate Wizard | 19.95 |
| Where is Carmen Sandiego | 23.95 |
| Wizard's Crown | 27.95 |

## EDUCATIONAL PROGRAMS

| | |
|---|---|
| Bank Street Storybook | $27.95 |
| Cave Of The Word Wizard | 18.95 |
| Donald Duck's Playground | 16.95 |
| Evelyn Wood's Dynamic Reader | 35.95 |
| Gertrude's Secrets | 20.95 |
| Grammer Examiner | 30.95 |
| Perfect Score S.A.T. | 49.95 |
| Reader Rabbit | 26.95 |
| Sky Travel | 27.95 |
| The Game show | 23.95 |
| Grade Level Subject Disks | 13.95 |
| Tic Tac Show | 23.95 |
| Subject Diskettes | 13.95 |
| Typing Tutor III | 26.95 |
| Winnie the Pooh | 16.95 |

## WORD PROC. - DATA BASES SPREAD SHEETS

| | |
|---|---|
| Batteries Incl. - Home Organizer Series | |
| Audio/Video Catalog | $13.95 |
| Checkbook | 13.95 |
| Electronic Address Book | 13.95 |
| Home Inventory | 13.95 |
| Mail List | 13.95 |
| Photos/Slides/Home Movies | 13.95 |
| Recipes | 13.95 |
| Stamps | 13.95 |
| Fleet System 2 (Limited Quantity) | 29.95 |
| Mirage Data Base Manager | 38.95 |
| Multiplan | 42.95 |
| Pocket Planner or Writer or Filer | 27.95 |
| Sideways | 19.95 |
| Superbase 64 | 52.95 |
| Swiftcalc w/Sideways | 35.95 |
| Sylvia Porter's Pers. Finance | 42.95 |
| Visawrite 128 | 51.95 |

## GRAPHICS & MUSIC

| | |
|---|---|
| Adv. Music Sys. (MIDI compatible) | $49.95 |
| B-Graph (limited quantities) | 19.95 |
| Billboard Maker | 29.95 |
| Computer Eyes | 99.95 |
| Comp. Eyes Compatibility Disks | 12.95 |
| Disney Card & Party Shop | 19.95 |
| Disney Comic Strip Maker | 19.95 |
| Doodle | 26.95 |
| Flexidraw | 119.00 |
| GEOS | 40.95 |
| Graphics Expander | 26.95 |
| Icon Factory | 29.95 |
| Music Studio | 20.95 |
| Newsroom | 34.95 |
| Newsroom Clip Art #1 | 21.95 |
| Newsroom Clip Art #2 | 23.95 |
| PrintMaster (Program) | 26.95 |
| PrintMaster Art Gallery 1 & 2 | 15.95 |
| Print Shop (Program) | 29.95 |
| Print Shop Companion | 23.95 |
| Print Shp. Gr. Lib. 1 or 2 or 3 | 16.95 |
| Screen Dumper 64 | 16.95 |

## MISCELLANEOUS

| | |
|---|---|
| 1541 Physical Exam | $33.95 |
| Clone Machine (Super Clone) | 21.95 |
| Copy II 64/128 V 2.8 | 26.95 |
| CSM Disk Alignment | 32.95 |
| Disks (Boxes of 10 DS/DD) | 8.95 |
| Fast Load | 26.95 |
| Pick' Em '86 | 43.95 |
| Snapshot | 40.95 |
| Super Kit 1541 | 23.95 |

## COMMODORE 128 SOFTWARE

| | |
|---|---|
| CAD Pack 128 | $45.95 |
| Mach 128 (accellerates 128 loads) | 34.95 |
| Paperback Planner 128 | 34.95 |
| Paperback Writer 128 | 34.95 |
| Partner 128 | 34.95 |
| Superbase 128 | 69.95 |
| Timeworks Data Manager 128 | 49.95 |
| Timeworks Swiftcalc 128 | 49.95 |
| Timeworks Word Writer 128 | 49.95 |

FLOPPY HOUSE SOFTWARE

20 S. Chestnut Street
Box 308
Palmyra, PA 17078

TOLL FREE 1-800-633-8699

IN PENNA. CALL 717-838-8632

## AMIGA SOFTWARE

| | |
|---|---|
| Aegis Animator | $94.95 |
| Aegis Draw | 135.00 |
| Aegis Images | 54.95 |
| Analyze (Spreadsheet) | 69.95 |
| Arctic Fox | 29.95 |
| Brataccus | 35.95 |
| Delta Patrol | 16.95 |
| Deluxe Paint | 59.95 |
| Art Disk | 22.95 |
| Deluxe Print | 69.95 |
| Art Disk | 22.95 |
| Deluxe Video | 69.95 |
| Hacker | 31.95 |
| Halley Project | 31.95 |
| Infocom Titles in stock | CALL |
| Marble Madness | 35.95 |
| Mind Shadow | 31.95 |
| Music Studio | 42.95 |
| One On One | 29.95 |
| Rogue | 24.95 |
| Scribble (Word Processor) | 69.95 |
| Seven Cities of Gold | 29.95 |
| Skyfox | 29.95 |

## HARDWARE AND PERIPHERALS

| | |
|---|---|
| Anchor 6480 300/1200 BAUD Modem | $129.00 |
| Disk Notcher (Interex) | 5.95 |
| Estes Power-Pack (Serviceable) | 41.95 |
| McPen (High-Res Light Pen) | 40.95 |
| Messinger Modem (300 BAUD) | 49.95 |
| MicroStuffer Buffer (64K) | 59.95 |
| Mighty Mouse | 44.95 |
| Omni-Tronics RS-232 Interface | 39.95 |
| PPI Interface | 39.95 |
| Power Pack (Maxtron or Commodore) | 28.95 |
| Pro-Tech Vinyl Cover C64 or C128 | 5.35 |
| Vinyl Cover - 1541 or 1571 | 5.35 |
| Vinyl Cover - Most printers | 6.50 |
| Vinyl Cover - Most Monitors | 10.95 |
| Ribbons - 1525/801 Printers | 7.95 |
| Ribbons - 1526/802 printers | 8.95 |
| Ribbons - Star SG10 1.95 - Color | 3.95 |
| Ribbons - Other | CALL |
| Six Outlet Surge Protector | 21.95 |
| Tac 2 Joysticks | 9.95 |
| Underwear Transfer Ribbons | 10.95 |
| Underwear Colored Pens (Set) | 10.95 |
| Xetec Super Graphic Interface | 62.95 |

**LEROY'S CHEATSHEETS ............ $2.95**

| | |
|---|---|
| Basic | Practicalc |
| Blanks (3) | Practicalc II |
| Calc Result Adv. | Printers |
| Calc Result Easy | Epson RX80 |
| Comal (1.4) | Gemini 10X |
| The Consultant | 1525/801 |
| Disk 1541 | Microline |
| Doodle | Quick Brown Fox |
| Easy Script | Simon's Basic |
| Fleet System II | Sky Travel |
| Flight Simulator II | Speedscript |
| For the Beginner | Sprites Only |
| Hes Writer | Superbase 64 |
| Logo Sheet 1 | Terminals |
| Logo Sheet 2 | Smart64 |
| The Manager | Vidtex |
| Multiplan | VIP |
| Omniwritter | Word Pro 3+ |
| Paperclip | Word Pro 64 |
| GEOS | Elite |

**MAILING CHARGE ON LEROY'S CHEATSHEETS $1.00**

## ORDERING & TERMS

- VISA & Master Card - no additional charge
- $2.50 Shipping charge - Shipping free on orders over $100.00
- LEROY'S total mailing charge $1.00 for any quantity
- C.O.D. orders - add $1.90 extra
- PA residents add 6% Sales Tax
- FPO & APO - no additional charge
- We try to keep our prices as low as possible to serve our valued customers. In order to do this we are prosecuting credit card fraud to the full extent of the law.

Reader Service No. 159

it again.

—C.C. Stalder
Waynes, NC

## LIGHTS OUT

If that flashing red light on the 1541 is trying your patience, turn it out—with *Lights Out. Lights Out* tells you what error crept into the 'ol disk drive and mercifully douses the light. It's easy to use and works with both the C-64 and VIC 20.

First load and run *Lights Out*. Now you can load and save all the programs you want. Whenever you need to read an error channel (because that red light won't quit winking at you), type SYS 980 and press RETURN. Presto, you'll see what went wrong, and the panic light will go out.

*Lights Out* loads into the cassette buffer from 980 to 1018. If necessary, you can relocate it by changing the variable for the starting address (SA), in line 30, to the new starting address. Be sure the new location has room for it (39 bytes). Everything else is automatic.

—Buck Childress
Salem, OR

```
•10 REM *** LIGHTS OUT *** BUCK CHILDRESS
 *** SALEM, OR 97309
•20 PRINTCHR$(147)"LOADING DATA":PRINT
•30 SA=980:REM CHANGE THIS TO RELOCATE
•40 FORJ=SATOSA+38:READA:POKEJ,A:X=X+A:NE
XTJ
•50 IFX<>5736THENPRINT"ERROR IN DATA":END
•60 PRINT"DATA OK":PRINT:PRINT"SYS"SA"TO
ACTIVATE":END
•70 DATA169,15,168,162,8,32,186,255,169,0
,32,189
•80 DATA255,32,192,255,162,15,32,198,255,
32,207,255
•90 DATA201,13,240,5,32,210,255,208,244,3
2,231,255,76,204,255
```

## MONAID

Here is an 80 byte ML program, in the form of a BASIC loader, which adds a printer output command to the C-128's machine language monitor. Enter, save, and run *Monaid*. The program will POKE a short ML program into memory and then advise you to SYS 3504 to enable. Executing the SYS will cause you to enter the monitor with two extra commands available, P (printer on) and O (printer off). Selecting P will direct the output of all monitor commands to the printer. Selecting O turns the printer off and redirects output to the screen.

—Bob Ossentjuk
Sierra Vista, AZ

```
•3468 PRINT"[CLEAR][DOWN]LOADING MONAID D
ATA, PLEASE WAIT"
•3480 FORX= 3504 TO 3583 :READA:CS=CS+A:P
OKEX,A:PRINT".";:NEXTX:PRINT
•3492 IFCS <> 9012 THENPRINTCHR$(7)"DATA
 ERROR!":STOP
•3504 DATA 169, 194, 141, 46, 3, 169, 13
, 141, 47, 3, 32, 125
•3516 DATA 255, 7, 0, 76, 33, 176, 201,
80, 240, 7, 201, 79
•3528 DATA 240, 36, 76, 6, 176, 32, 125,
 255, 7, 13, 0, 169
•3540 DATA 0, 141, 0, 255, 32, 189, 255,
 169, 4, 170, 160, 1
•3552 DATA 32, 186, 255, 32, 192, 255, 1
62, 4, 32, 201, 255, 76
•3564 DATA 139, 176, 169, 0, 141, 0, 255
, 169, 4, 32, 231, 255
•3576 DATA 32, 125, 255, 7, 0, 76, 139,
176
•3588 PRINT"[DOWN][DOWN]SYS 3504 : REM TO
 ENABLE[3"[UP]"]":NEW
```

## REVERSE VIDEO

The Commodore 128 has a feature that turns the 80-column screen into reverse video when ESC and then R is pressed. This sounds impressive; however, when I purchased my system, I did not obtain the necessary accessories to produce 80-column output. Therefore, I wrote *Reverse Video* for my 40-column screen. It will turn anything that is reversed to non-reversed and anything that's non-reversed into reversed.

Below are totally relocatable versions for the C-128 in 40-column mode and the C-64. An SYS to the starting address will instantly perform the deed.

Note that the last three lines of the loader are there just to offer a quick example.

—Shawn K. Smith
Bronx, NY

```
•1 REM  REVERSE VIDEO BY SHAWN K. SMITH
•2 REM  FOR C64 OR C128 IN C64 MODE....
•3 S=00830:FORD=STOS+20:READY:POKED,Y
•4 NEXT:PRINT"[RVSON]SYS"S" FOR REVERSE V
IDEO!
•5 DATA 234,162,024,160,039,032,240,233
•6 DATA 177,209,073,128,145,209,136,016
•7 DATA 247,202,016,239,096
•9 FORD=0TO39:A$=A$+CHR$(32):NEXT:N=99
•10 FORD=1TO16:POKE646,D:PRINTA$;:NEXT
•11 FORT=1TON:FORD=1TON-T:NEXT:SYSS:NEXT
```

---

```
•1 REM REVERSE VIDEO BY SHAWN K. SMITH
•2 REM FOR C128 IN 40 COLUMN MODE ONLY
•3 S=5555:BANK (1+2+3+4+5):PRINT
•4 FORD=STOS+23:READY:POKED,Y:NEXT
•5 PRINT"[RVSON]SYS"S"[RVSOFF]FOR REVERSE
 VIDEO!
•6 DATA 165,215,208,019,162,024,160,039
•7 DATA 032,094,193,177,224,073,128,145
•8 DATA 224,136,016,247,202,016,239,096
•9 FORD=0TO39:A$=A$+CHR$(32):NEXT:N=99
•10 FORD=1TO16:COLOR5,D:PRINTA$;:NEXT
•11 FORT=1TON:FORD=1TON-T:NEXT:SYSS:NEXT
```

# ...Announcing

THE
COMMODORE USERS

# Ahoy! Access Club!

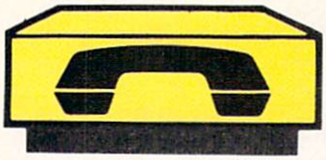



**FREE TO ALL SUBSCRIBERS**




An incredible offer from the publishers of *Ahoy!*...The ***Ahoy!* Access Club.** The ***Ahoy!* Access Club** offers members: discounts, rebates, coupons on products and services for your Commodore, a Commodore calendar of events, and much, much more! Members will also receive "The Clipper," an exclusive bi-monthly news bulletin. But the best thing about the ***Ahoy!* Access Club** is that it's **FREE!** to all *Ahoy!* subscribers. Subscribe today! and along with your first issue of *Ahoy!* you'll receive your official ***Ahoy!* Access Club** membership card...your ticket to super savings and bonuses you can only get from *Ahoy!* Don't miss out on this fantastic offer. The ***Ahoy!* Access Club**...if you own a Commodore — this club is for you!

**THE COMMODORE MAGAZINE THAT OFFERS YOU MORE**



# FREE MODEM

## *When you subscribe to* Ahoy! *and PlayNET!*

Below you'll find details on **PlayNET**, the leading entertainment bulletin board service for Commodore users—and *Ahoy!*, your favorite Commodore publication. What's the connection? There are two:




• If you subscribe to *Ahoy!* for $21.95, you'll receive a **PlayNET** membership kit—a $19.95 value—for free!

• And to connect you and your Commodore to **PlayNET**—if you agree to subscribe to **PlayNET** for three months, an auto dial/auto answer modem will be sent to you free of charge!

## PlayNET

Among the many services it offers, PlayNET lets you post announcements, join in the excitement of many special interest groups, and get all the latest information on the C-128 and the Amiga. Communicate with people from all over the country!







PlayNET also provides 14 full-color games you can play with other subscribers, including Backgammon, Boxes, Bridge, Capture the Flag, Checkers, Chess, 4 in a Row, Go, Gomoku, Hangman, Quad 64, Reversi, and Sea Strike.

The Software Delivery Service has a Trading Post for selling self-written software and a Public Domain Library where thousands of programs are available for downloading.




GREAT NEWS! New rate structure gives subscribers four free hours every month!

## Ahoy!

For a limited time, $21.95 buys you a 12-issue subscription to *Ahoy!*—all the programs, features, and reviews for which you'd pay $33.00 a year at the newsstand—plus a $19.95 PlayNET membership kit!

You'll also have access to the following *Ahoy!* services available through PlayNET:

• The *Ahoy! Port of Call,* weekly teleconference with *Ahoy!'s* writers and editors
• Downloading of *Ahoy!* programs at a nominal fee
• Discount prices on *Ahoy!* disks and back issues
• Multiuser access to *Ahoy!* Bulletin Board

Complete all items on coupon or order will not be processed.

Offer expires 12/31/86.

Good only in USA.

Mail coupon and check for $21.95 to:

*Ahoy!*/PlayNET
Subscription Offer
Ion International Inc.
45 W. 34th St.—Suite 407
New York, NY 10001

☐ Send me 12 issues of *Ahoy!* Enclosed is my check or money order, payable to Ion International Inc., for $21.95. Also, sign me up to PlayNET* for one month, and send me the membership kit ($19.95 value) free of charge.

☐ In addition, I agree to subscribe to PlayNET* for three months. Send me my free auto dial/auto answer modem now.

*As a PlayNET member I will be billed on my credit card $2.75 per online hour and $12.00 per month account maintenance fee, which includes four free hours of online time each month. I can cancel my membership at any time by writing to PlayNET, but if I receive a modem and cancel before 90 days I will be billed $44.00. A shipping and handling fee of $3.00 will be added to my first month's bill.

NAME________________

ADDRESS________________

CITY________ STATE____ ZIP____

TELEPHONE________________

Circle One: MC/VISA Card #________________

Expiration Date________________

Signature of Credit Card Holder________ Date____

# COMMODARES

## PROGRAMMING CHALLENGES

### By Dale Rupert

Each month, we'll present several challenges designed to stimulate your synapses and toggle the bits in your cerebral random access memory. We invite you to send your solutions to:

*Commodares,* c/o *Ahoy!*
P.O. Box 723
Bethel, CT 06801

We will print and discuss the cleverest, simplest, shortest, most interesting and/or most unusual solutions. Be sure to identify the *name* and *number* of the problems you are solving. Also show sample runs if possible. Be sure to tell what makes your solutions unique or interesting, if they are.

Programs on diskette (1541 format only) are welcome, but they must be accompanied by listings. You must enclose a stamped, self-addressed envelope if you want any of your materials returned. Solutions received by the middle of the month shown on the magazine cover are most likely to be discussed, but you may send solutions and comments any time. Your original programming problems, suggestions, and ideas are equally welcome. The best ones will become *Commodares*!

#### PROBLEM #35-1: ROUND ABOUT

This problem was submitted by Bill Sinclair Jr. of Hurlock, MD. The user inputs a string, and the computer scrolls it counterclockwise in a marquee fashion around the outer perimeter of the screen. The string will start on the top line of the screen and crawl down the left side of the screen. As it moves across the bottom line of the screen, it will be in reverse order. Then it crawls up the right side, and the process is repeated. (Bill suggests that you more advanced programmers do this as a machine language interrupt routine so the message could be displayed during another program.)

#### PROBLEM #35-2: SERIES SEQUENCE

James Bickers (Shepherdsville, KY) suggested this problem for you baseball and/or permutations fans. In a seven-game World Series, games are played until one team has won four games. Write a program which displays all possible win/loss sequences for the winning team. A few possibilities are

```
W W W W
W W W L W
W L L W W W
L L L W W W W
```

Can your program be easily modified to handle any series of X wins out of Y (maximum) games?

#### PROBLEM #35-3: TIME CONVERTER

Jim Speers (Niles, MI) suggested this little challenge. The user enters a number of hours in decimal format, and the computer converts it to hours:minutes:seconds format. For example, 6.42135 becomes 6:25:17.

#### PROBLEM #35-4: BAD LUCK

Here is a possible application of the Date Ditty solutions discussed below. The user enters today's date, and the computer responds with the date of the next Friday the 13th. Good luck.

This month we will look at readers' solutions to *Commodares* from the July 1986 issue. *Problem #31-1: Date Ditty* brought numerous solutions. The problem was for the computer to give the day of the week for any date in the 1900's. A programming "ditty" is meant to be a small, single-purpose routine. The solutions ranged from very short programs that work for most days in the twentieth century to much longer programs that give valid results from the year 100 AD to 2099 AD.

One of the shortest programs is listed below, from Keith Kushner (Brooklyn, NY).

```
·1 REM COMMODARES PROBLEM #31-1:
·2 REM     DATE DITTY
·3 REM SOLUTION BY
·4 REM     KEITH KUSHNER
·5 REM
·10 REM -VALID FOR 1900'S AFTER 2/28/1900
·20 REM -ENTER JULY 4, 1986 AS 7,4,86
·30 REM
·40 FOR N=0 TO 6:READ D$(N):NEXT
·50 DATA SATURDAY,SUNDAY,MONDAY,TUESDAY,W
 EDNESDAY,THURSDAY,FRIDAY
·60 INPUT"M,D,Y";M,D,Y:IF M<3 THEN M=M+12
 :Y=Y-1
·70 N=D+2*M+INT(.6*(M+1))+Y+INT(Y/4)+3 :
 N=INT((N/7-INT(N/7))*7+.5):PRINT D$(N)
```

Keith's program doesn't allow for the fact that the year 1900 was *not* a leap year, so January and February dates for that year are given as a day earlier than they should be. For example, January 1, 1900 was a Monday, not a

Sunday as the program says. Of course, it wouldn't take much effort to check for those two months and fix the program. Give it a try.

Most of the programs submitted allow the user to enter almost anything for the date. The following program from Karen Middaugh (San Diego, CA) adds error-checking to make sure that only valid dates are given.

```
•1 REM COMMODARES PROBLEM #31-1:
•2 REM       DATE DITTY
•3 REM SOLUTION BY
•4 REM       KAREN MIDDAUGH
•5 REM
•10 DIM K(12):FOR I=1 TO 7:READ D$(I):NEX
 T:FOR I=1 TO 12:READ K(I):NEXT
•20 INPUT "INPUT YEAR: 19";Y
•30 INPUT"INPUT MONTH (1-12): ";M :IF M<1
  OR M>12 THEN 30
•40 INPUT "INPUT DAY: ";D :IF M=2 AND D>2
 8 AND (Y/4<>INT(Y/4) OR Y=0) THEN 40
•50 IF (M=4 OR M=6 OR M=9 OR M=11) AND D>
 30 THEN 40
•60 IF D<1 OR D>31 OR (M=2 AND D>29) THEN
 40
•70 L=INT((Y+3)/4):DA=6+Y+L+K(M)+D :IF IN
 T(Y/4)=Y/4 AND M>2 THEN DA=DA+1
•75 IF Y=0 AND M<3 THEN DA=DA+1
•80 IF DA>7 THEN DA=DA-7 :GOTO 80
•90 PRINT M"/"D"/"Y" IS A "D$(DA)"DAY"
•100 DATA MON,TUES,WEDNES,THURS,FRI,SATUR
 ,SUN,0,3,3,6,1,4,6,2,5,7,3,5
```

Don't try to enter February 29, 1900 into this program. It allows only valid months and their corresponding days to be entered. The IF/THEN statement in line 40 determines if a date of 29 or greater is entered for February in a non-leap year. Notice that Y/4 is an integer for leap years. The Y=0 condition handles the special case that 1900, by definition or agreement, was not a leap year.

Line 50 implements the expression "Thirty days hath September, April, June, and November," and line 60 checks the other months. From line 40, a February date greater than 28 is allowed only in a leap year. Line 60 makes sure that any such date is not more than 29. The heavy work is done by line 70. Line 75 fixes the January, February 1900 dilemma discussed earlier. Line 80 implements the MOD 7 function. This line repeatedly subtracts 7 from a number until the result is between 0 and 6. Compare this line with the corresponding statement in line 70 of Keith's program:

```
N = INT((N/7 - INT(N/7))*7 + .5)
```

The repeated subtraction works fine but it can take quite a while if the original number is large.

There were nearly as many algorithms for calculating the day as there were programs submitted. The use of "month values" in Karen's program reminded me of the discussion of this problem in Martin Gardner's book *Mathematical Carnival* (Vintage, 1977). Martin Gardner presents a procedure (originated by Lewis Carroll in 1887) by which anyone can mentally calculate the day of the week for any date. The procedure involves being able to "cast out 7's" and requires memorizing 12 simple month values. You too can amaze your friends with your mental prowess. The calculations can be performed in your head in less than 30 seconds with practice. Who needs a computer?

Doug Vanderploeg (Norwich, CT) sent a lengthy program which he claims will handle all dates from 01JAN 0100 to 31DEC2099. It takes into account the change to the calendar in 1752 made by Pope Gregory XIII in which 11 days were dropped. (The day after September 2, 1752 was September 14, 1752 in the English-speaking countries.) If you want a listing of Doug's program, send a legal size, self-addressed, stamped envelope to me with your request clearly stated. Look into Gardner's book or an encyclopedia for more information on calendars.

*Problem # 31-2: Cryptic Math* was just plain tedious. The problem was to find which permutations of the numerals 0 through 9 make this expression true: AB * CDE = FGH * IJ, where each letter represents a different numeral. There are only 10! (ten factorial) possibilities, since there are ten choices for A, nine choices for B once A has been picked, eight choices for C, and so forth. The total is 10*9*8*7*6*5*4*3*2*1 or 3,628,800.

Congratulations to Dennis McGrath (Cicero, IL) who wrote his first major program in COMAL 2.0 to solve this problem. He realized that BASIC was not going to be fast enough. Dennis' four page (double spaced) program found 198 solutions in an elapsed time of 2,505,027 jiffies. That translates to just under 12 hours. Send me a legal size, self-addressed, stamped envelope if you are interested in seeing Dennis' COMAL solution. He found the high product to be 58560 (80*732 = 915*64) and the low product to be 3588 (23*156 = 897*04).

Paul Sobolik (Pittsburgh, PA) wrote the following BASIC program, based upon the permutation scheme from Allan Flippin in the April 1986 *Commodares*.

```
•1 REM COMMODARES PROBLEM #31-2:
•2 REM      CRYPTIC MATH
•3 REM SOLUTION BY
•4 REM      PAUL SOBOLIK
•5 REM
•10 CLR : DIM C(9) : S$="9876543210"
•20 J=9
•30 W=VAL(LEFT$(S$,2)):X=VAL(MID$(S$,3,3)
 )
•40 Y=VAL(MID$(S$,6,3)):Z=VAL(RIGHT$(S$,2
 ))
•50 IF W*X=Y*Z THEN PRINT W"*"X"="Y"*"Z
•60 S$=LEFT$(S$,J-1)+RIGHT$(S$,10-J)+MID$
 (S$,J,1)
•70 C(J)=C(J)+1 : IF C(J)<=10-J THEN 20
•80 C(J)=0 : IF J>1 THEN J=J-1 : GOTO 60
```

Add line 55 PRINT W,X,Y,Z to see how the program works. After running this program, Paul realized why people go out and buy Cray-2 supercomputers. Paul's program had churned out only 27 solutions in over 19 hours of running when he took the philosophical attitude that "the problem is solved, so who cares about the solution?" At that rate, the program would be done in less than 6 days. Evidently Paul had better things to do with his computer. Congratulations also to David Shiloh (Eugene, OR) for his work on this problem.

In the April 1984 *Rupert Report,* I calculated that the C-64 BASIC has a speed of roughly 0.0002 megaflop/second. This is the number of "million (mega) FLoating-point OPerations (flop)" the computer can perform each second. One of my references gives the CDC Cyber 205 supercomputer a rating of 25 megaflop/second. Just to put this into perspective, Paul's six-day program on the 64 should take under five seconds on the Cyber 205. That's why people use supercomputers. (To put things further into perspective, what do you suppose *your* megaflop/second rating would be, even with a calculator?)

*Problem #31-3: Farm Figures* from Vern Leween (Brantford, ONT) brought a whole herd of solutions. With $10 cows, $3 sheep, and 50¢ pigs, the task was to buy exactly 100 head of livestock (including at least one of each) for exactly $100. The most straightforward solution is represented by this COMAL program from Sol Katz (Lakewood, CO):

```
•1 REM COMMODARES PROBLEM #31-3:
•2 REM      FARM FIGURES
•3 REM COMAL SOLUTION BY
•4 REM      SOL KATZ
•5 REM
•10 :FOR C=1 TO 98 OPEN
•11 : FOR S=1 TO 98 OPEN
•12 :   FOR P=1 TO 98 OPEN
•13 :    IF C+S+P=100 AND (C*10)+(S*3)+(P*
 .5)=100 THEN
•14 :      PRINT"PIGS, COWS, SHEEP =",P,C,S
•15 :      STOP
•16 :    ENDIF
•17 :   ENDFOR P
•18 : ENDFOR S
•19 :ENDFOR C
```

Sol and most others did some additional pre-computation figuring in order to simplify and accelerate their programs. An easy calculation shows that no more than 9 cows or 29 sheep can be bought if there is to be at least one of each animal within the $100 limit. Also, if C is the number of cows, and S is the number of sheep, then the number of pigs must be 100 − C − S. The tiny program from Keith Kushner (Brooklyn, NY) nicely implements this insight.

```
•1 REM COMMODARES PROBLEM #31-3:
•2 REM      FARM FIGURES
•3 REM SOLUTION BY
•4 REM      KEITH KUSHNER
•5 REM
•10 FORC=1TO9:FORS=1TO29:P=100-(C+S):ON-(
 C*10+S*3+P*.5=100)GOSUB20:NEXTS,C:END
•20 PRINT C;"COWS";S;"SHEEP";P;"PIGS" :RE
 TURN
```

Keith's ON/GOSUB statement in line 10 merits some discussion. It contains the logical expression (C*10 + S*3 + P*.5 = 100) which the computer interprets as either True (equal to −1) or False (equal to 0). This expression compares the cost of the animals with $100. If the cost does not equal $100, the expression is False. Negative zero is zero, and the ON/GOSUB statement falls through to the NEXT S,C statement. If the expression is True, the negative of −1 is 1, and the ON/GOSUB statement branches to the first line number following the GOSUB, namely line 20.

The advantage of using this ON/GOSUB statement is that other statements may follow it in the same program line. The alternative is to use the standard IF/THEN statement which would require an additional program line for the NEXT S,C and END statements. As a simple example, in the line


COMMODORE 128 OWNERS
THE REVISED CLONE ENDS THE SOFTWARE BACK-UP BLUES!

The complete update to the 1571 Clone is now being shipped. Our new manual is almost 50 pages long and explains all aspects. We improved the GCR & Nibble copiers and added a MFM Copy (back up IBM disks on Commodore?). The expansion section has over 50 files. Included is a block editor, auto boot maker, single or 2 side copy, copy to alt. sides, track analysis (sync marks, density, block size, GCR data, Hex data), bulk erase, format, copy & combine files, plus more. Over 25 selections from menus. Use with a 1 or 2 1571 drive system.

STILL ONLY $49.95

BACKS-UP MOST EVERYTHING

WE'LL STILL GIVE YOU $10 TRADE FOR YOUR OBSOLETE COPY DISK



Available from:
Micro-W. DISTRIBUTING, INC
1342B Route 23
Butler, N.J. 07405
CALL: (201) 838-9027

$10 UPGRADE for all registered 1571 CLONE MACHINE Owners
VISA • MASTERCARD
DEALER & DIST INQUIRES

Reader Service No. 163

```
10 IF A=B THEN GOSUB 50 : PRINT A
```

the PRINT statement is executed only when A=B, since the remainder of the line is skipped when the IF condition is false. If the PRINT statement is to be executed every time line 10 is reached, we must rewrite line 10 and add another line:

```
10 IF A=B THEN GOSUB 50
15 PRINT A
```

These two lines can be reduced to one as follows:

```
10 ON -(A=B) GOSUB 50 : PRINT A
```

The only disadvantage of this method is the relative obscurity of its operation. This concept can be further extended if the program should temporarily branch to one of two different places depending upon the equivalence of A and B. For example,

```
10 ON 1-(A=B) GOSUB 50,60 : PRINT A
```

Now if A does not equal B, 1−(A=B) has a value of 1, and the program branches to line 50. If A equals B, 1−(A=B) has a value of two since (A=B) is −1, and the program branches to line 60. In either case, execution returns to the PRINT A statement after the appropriate subroutine is completed.

After Paul Sobolik (Pittsburgh, PA) finished figuring that no more than 9 cows or 29 sheep could be bought, he went a step further and thought, why not do some additional pre-computing and make the program as short as possible? His result is essentially this:

```
10 PRINT "BUY 5 COWS, 1 SHEEP, AND 94 PI
GS"
```

Sure enough, his program gives the right answer!

*Problem #31-4: Repeated Compression* from Thomson Fung (San Diego, CA) was a fun challenge for many readers. The problem was to input a string and compress any multiple characters into single ones. For example, "ttteeeessstt" becomes "test." You might think that such a simple problem would not allow for much creativity, but *Commodares* fans are not your ordinary thinkers.

The shortest solution is this one-liner from Keith Kushner (Brooklyn, NY):

```
·1 REM COMMODARES PROBLEM #31-4:
·2 REM   REPEATED COMPRESSION
·3 REM SOLUTION BY
·4 REM   KEITH KUSHNER
·5 REM
·10 INPUTI$:FORT=1TOLEN(I$):A$=MID$(I$,T,
 1):C$=C$+CHR$(ASC(A$)*-(B$<>A$)):B$=A$:N
 EXT:PRINTC$
```

You must use abbreviations to fit this on one C-64 line. Keith builds the string C$ by adding either the next letter or the null character CHR$(0) depending upon whether the current letter in A$ matches the previous letter which is in B$. Refer to the discussion above about logical expressions to see how the CHR$( ) value is determined. If the current letter is different from the previous letter, (B$< >A$) is true and has a value of −1, otherwise the expression has a value of 0. Since CHR$ and ASC are inverse functions, CHR$( ASC(A$)* −(−1) ) equals CHR$( ASC(A$) ) which is just A$, and CHR$( ASC(A$)* −(0) ) is CHR$(0).

Timothy Williams (Henderson, KY) uses magic in his solution to this problem listed below.

```
·1 REM COMMODARES PROBLEM #31-4:
·2 REM   REPEATED COMPRESSION
·3 REM SOLUTION BY
·4 REM   TIMOTHY W. WILLIAMS
·5 REM
·10 INPUTA$:FORA=1TOLEN(A$):B$=MID$(A$,A,
 1):PRINTB$;:IFC$=B$THENPRINTCHR$(20);
·20 C$=B$:NEXT
```

The magic is CHR$(20), the delete character. Enter a string with many repeated characters and watch the duplicates vanish before your very eyes.

*Finally...Bookkeeping Made Easy By...*

## THE ACCOUNTANT

*The ONLY Simplified Small Business Accounting System Written EXCLUSIVELY For The Commodore 128*

**ONLY ONE PROGRAM & ONE DATA DISK DO IT ALL!**

*(Just think...no more swapping disks!!!)*

FEATURES INCLUDE:
- General Ledger
- General Journal
- Check Register
- Over 20 Reports Automatically
- Payroll Computation & Write-up
- Payroll Check Writing
- W-2 Printing
- Quarterly Report
- Accounts Receivable "Filing System"
- Customer Billings
- Accounts Payable "Filing System"

**ONE PRICE FOR EVERYTHING**

**$149.95**

*Integrated Packages Coming Soon!*
*Sales & Inventory Control/Construction Accounting*
*Professional Client Billing/Restaurant Accounting*

**SEND $149.95 TO:**
**KFS** Software, Inc.
1301 Seminole Blvd. #153A
Largo, Florida 33540

**Sample Available $9.95 PREPAID**
For C.O.D. Orders Phone:
**(813) 584-2355**

(FL Residents add 5% Sales Tax)

Reader Service No. 170

# BREAK THROUGH




Ahoy! uses only **maxell** premium quality disks.

## with Ahoy!

## PROGRAM DISKS AND CASSETTES

Why waste time typing? All the programs in this issue of *Ahoy!* are available on disk or cassette! Use the coupon below to order a single disk or tape or a subscription... as well as the special disks described at left.

**BEST OF '85**
Music Tutor
Midprint
Fontasia
Telelink
Futurewar!
Salmon Run
Auto Line Numbers
Home Budget
Tile Time
Screen Dump
Ahoy! Dock
File Lock
Lightning Loader
Directory Manipulator
Gameloader
Jewel Quest

**BEST OF '84**
Multi Draw 64
Address Book
VIC Space Lanes
64 Space Lanes
Name that Star
Lunar Lander
Air Assault
Math Master
Biorhythm
Checklist
The Alpiner
Post Time
Salvage Diver
DOS
Micro Minder '85
VIC 40
Emerald Elephant
Lawn Job
Construction Co.
Space Patrol
Multi Draw Boot

**BEST UTILITIES**
Booter
BASIC Trace
Two Column Directory
Commodore Font Editor
Screen Magic
Screen Bit Dump
Printat
Auto Append
Formatter
Windows
Start & End File Address
Fastnew
Maestro
1541 Cleaning Utility
DOS
Base Conversions
Micro Minder '85
Lucky Lottery

**BEST GAMES**
Name That Star
Post Time
Alpiner
Salvage Diver
Lawn Job
Emerald Elephant
Construction Co.
Space Patrol
Tile Time
Duck Shoot
Script Analysis
Wizard of Im
Disintegrator
Gators N Snakes
Dragon Type
Gravinauts
Mystery at Mycroft Mews

## SINGLE ISSUE AND SUBSCRIPTION PRICES

(Postage and Handling Included)

| | U.S.A. | CANADA | ELSEWHERE |
|---|---|---|---|
| ❑ November '86 *Ahoy!* Disk<br>❑ November '86 *Ahoy!* Cassette | $ 8.95 | $ 12.95 | $ 13.95 |
| ❑ 12-Month Disk Subscription<br>❑ 12-Month Cassette Subscription | $ 79.95 | $ 99.95 | $124.95 |
| ❑ 24-Month Disk Subscription<br>❑ 24-Month Cassette Subscription | $149.95 | $179.95 | — |

$10.95 EACH (disk only): ❑ Best of '84 ❑ Best of '85 ❑ Best Utilities ❑ Best Games

## BACK ISSUES $8.95

In Canada add $2.00 per issue; outside US and Canada add $4.00 per issue.

| | | | |
|---|---|---|---|
| ❑ ______ | $8.95 | ❑ ______ | $8.95 |
| ❑ ______ | $8.95 | ❑ ______ | $8.95 |
| ❑ ______ | $8.95 | ❑ ______ | $8.95 |
| ❑ ______ | $8.95 | ❑ ______ | $8.95 |

**SPECIFY**
❑ *DISK* ❑ *CASSETTE*

Make check or money order payable to **Double L Software.** N.Y. State Residents must add 8¼% sales tax.

**Send coupon or facsimile to:**
***Ahoy!* Program Disk/Cassette**
**Ion International Inc.**
**45 West 34th Street, Suite 407**
**New York, NY 10001**

NAME ____________________
ADDRESS ____________________
CITY ____________ STATE ______ ZIP ______

Gary Hudach (Youngstown, OH) added some animation to his disappearing letters magic show.

```
•1 REM COMMODARES PROBLEM #31-4:
•2 REM   REPEATED COMPRESSION
•3 REM SOLUTION BY
•4 REM   GARY HUDACH
•5 REM
•10 U$=CHR$(145):INPUTA$:B$=CHR$(32)+A$:P
 RINTU$" "B$:FORT=2TOLEN(B$)
•20 IFMID$(B$,T,1)=MID$(B$,T-1,1)THENPRIN
 TU$SPC(T)CHR$(32):FORX=1TO200:NEXT
•30 IFMID$(B$,T,1)<>MID$(B$,T-1,1)THENC$=
 C$+MID$(B$,T,1)
•40 NEXT:FORA=1TOLEN(C$):PRINTU$SPC(A)MID
 $(C$,A,1)
•50 FORB=LEN(C$)TOLEN(B$):PRINTU$SPC(1+B)
 CHR$(32):NEXTB,A
```

You must not enter a string longer than one screen line for this program to work properly.

Buck Buchanan (of parts unknown) sent a BASIC solution and a functionally equivalent COMAL solution to this problem. COMAL can treat strings as arrays of single characters. Consequently some of the string operations are easier in COMAL. For example, these BASIC statements:


COMMODORE-64

SOFTWARE-OF-THE-MONTH CLUB®

(division of O.C.S., Inc.)

*We guarantee you'll never again buy useless software for your personal computer.*

**CLUB MEMBERSHIP OFFERS BIG SAVINGS**

**NO OBLIGATIONS**

When you enroll you will

- Keep only the software that you can use. Examine for a full 10 days; if it's not what you want, return it for a full refund.
- Receive discounts up to 30% on your software choices.
- Be eligible for our Bonus Point Plan—additional discounts applied toward purchases.
- Receive our informative monthly newsletter full of helpful tips for getting the most from your Commodore-64.
- Receive notice of *Special Sales* where you'll save as much as 50% off list.

*The Software-of-the-Month Club is Unique.*
No minimum purchases are required—no automatic shipments to you.

Enroll now and receive *absolutely free* Public Domain Software.
Please check ☐ Cassette ☐ Disk

GREAT IDEA! I can't lose. Enroll me now in the Software-of-the-Month Club. I understand there is no obligation. Enclosed is my $10 membership fee.

☐ Check ☐ Money Order ☐ Bank Card

Name ______

Address ______

City/State/Zip ______

Visa/MC# ______ Expiration date ______

Signature ______

Cut out and mail today to

SOFTWARE-OF-THE-MONTH CLUB
Ohio Computer Services, Inc.
P.O. Box 128723
Cincinnati, Ohio 45212

3

Reader Service No. 185


```
10 IF MID$(CI$,J,1)<>MID$(CI$,K,1) ...
20 CF$ = LEFT$(CF$,N-1) + MID$(CI$,J,1)
+ MID$(CF$,N+1)
```

are equivalent to these COMAL statements:

```
10 IF CI$(J)<>CI$(K) ...
20 CF$(N) = CI$(J)
```

Line 10 compares the Jth character to the Kth character in CI$. Line 20 replaces the Nth character in CF$ with the Jth character in CI$. Line 20 in BASIC 7.0 may be written as

```
20 MID$(CF$,N,1) = MID$(CI,J,1)
```

Jim Speers didn't like the idea that "SSPPPEEERRSSS" was compressed to "SPERS." His modification allows double letters to be included as long as they are separated by "/".

```
•1 REM COMMODARES PROBLEM #31-4:
•2 REM   REPEATED COMPRESSION
•3 REM SOLUTION BY
•4 REM   JIM SPEERS
•5 REM
•10 INPUT"ENTER TEXT";X$:P$=LEFT$(X$,1)
•20 FORI=2TOLEN(X$):IFMID$(X$,I,1)=MID$(X
 $,I-1,1)THEN40
•25 IFMID$(X$,I,1)="/"THEN40
•30 P$=P$+MID$(X$,I,1)
•40 NEXT I:PRINT P$
```

Line 25 of the program checks for the separation character. Now he can enter "SSPPPEEE/EEERRRRSS" and the computer responds with "SPEERS." Without running this program, can you predict the result of having several consecutive /'s?

Thanks and congratulations this month to the following people not already mentioned who wrote with challenges and solutions:

Tim Bauer (Sapulpa, OK)
Eric Biberhofer (Dundas, ONT)
Kent Black (Kountze, TX)
Sean Connor (Melfort, SASK)
Bo Cordle (Leesburg, FL)
Charles Grady (Cleveland, TN)
J.P. Grandbois (Hanmer, ONT)
David Hoffner (Brooklyn, NY)
Aaron Hughart (Nampa, ID)
Jeff McFarland (Hartland, MI)
Bill Okerblom (Providence, RI)
Aaron Rodden (Carlyle, IL)
Rick Roy (Santa Ana, CA)
Howard Shanks (Comox, BC)
J.H. Smalley (Boulder, CO)
Peter Troy (Casco, ME)
Nancy Wolecki (Rome, NY)
William Ballance (Jacksonville, NC)
Raymund Eich (Marshfield, MO)
Richard France (Red Bank, TN)
Robert Frazier (San Diego, CA)
W.T. Mallison (Rocky Mount, MC)
Michael Marron (Stony Brook, NY)
M. Mottel (LaGrange Highlands, IL)
Milum Perry, Jr. (Monterey, CA)
J. Reynolds (Holloman AFB, NM)
Gordon Rimac (Sterling Hts., MI)
Mario Segal (Mexico City, Mexico)
David Snay (Green Springs, OH)
Thomas Spafford (San Juan, PR)
Steven Steckler (Columbia, MD)
Wilbert Steiner (Hanover Park, IL)
D. Underwood (Walla Walla, WA)
Nolan Whittaker (Jeffersonville, KY)

Special thanks to Pol Magermans who sent *Commodares* solutions all the way from Verviers, Belgium. ☐

# PROMAL: A Look at a Programmer's Language

## By Cheryl Peterson

So far in this three-part series, we've compared Commodore BASIC, Pascal, and COMAL. We've seen that Pascal is very structured, while COMAL and BASIC can be structured but don't have to be. In this final installment, we take a look at another structured language. It is, in fact, as rigid as Pascal.

PROMAL (PROgrammer's Micro Application Langauge) was designed for programmers who want to sell their end product. It comes in two versions: one for commercial develcpers and one for those who plan to use their programs only for themselves. There is no royalty or fee charged for selling programs you write using the developer's system.

PROMAL programs must be compiled before they are run. A deficit of using a compiler-based program is having to recompile during the debugging process. If you have errors in your program, you have to reload the program into the editor, make any changes, leave the editor, and then recompile. This process must be repeated until all the mistakes are found. In some cases, even if the compiled program runs, errors can still occur. Finding these runtime errors is even more difficult than finding compile errors.

Knowing that the language is a bit more difficult to use than a non-compiled language, why would anyone choose it? Because the compiled programs run much faster than those written in interpreted languages like BASIC and COMAL. They also occupy less disk space. The end user does not need a copy of PROMAL to run the programs. And once the program is compiled, it is difficult for the end user to examine or modify the program, making it ideal for commercial programs.

PROMAL includes an editor and what is called the executive. The editor is used to type in your programs. The executive handles disk functions, other I/O (input/ output) operations, and compiling. With the commands included on the function keys, both of these are fairly easy to use.

### GETTING DOWN TO PROGRAMMING

PROMAL programs are structured similarly to Pascal programs. Each program must start with a program name and variables must be declared before being used. Procedures and functions are defined at the beginning. As with Pascal, PROMAL procedures and functions are called by name from within the body of the program.

PROMAL contains many of the same statements and commands as Pascal, but there are some major differences (see accompanying list of reserved words). One of these is the handling of I/O routines. In the language itself, there is no PRINT or its equivalent. Instead, several routines found in a library on the disk control this type of activity. Designed as procedures and functions, the library contains routines corresponding to the more complicated Pascal or BASIC commands. Because of this, one of the first lines in many programs will be INCLUDE LIBRARY. Our sample program will demonstrate the use of a couple of these library procedures.

Another major difference is the handling of strings. You can use literal strings to output text messages to the screen, but there is no variable type designed to handle strings. Instead, you must designate an array of type BYTE to hold any strings you wish to manipulate within the program. Although the data type WORD would seem appropriate to hold string variables, PROMAL defines WORDs as unsigned integer numbers between 0 and 65,535. This does give a little more flexibility than many other Commodore languages that have trouble handling integers over 32,767. However, it doesn't help with string manipulation.

### SYNTAX DIFFERENCES

In PROMAL you are limited to one statement per line.

### PROMAL RESERVED WORDS

**Commands**

| | | | | |
|---|---|---|---|---|
| AND | CHOOSE | FUNC | OR | TO |
| ARG | DATA | IF | OWN | TRUE |
| ASM | END | INCLUDE | PROC | UNTIL |
| AT | ELSE | INT | PROGRAM | WHILE |
| BYTE | ESCAPE | LIST | REAL | WORD |
| BEGIN | EXT | NEXT | REFUGE | XOR |
| BREAK | FALSE | NOT | REPEAT | |
| CON | FOR | NOTHING | RETURN | |

**Data Types**

| | |
|---|---|
| BYTE | INTEGER |
| WORD | REAL |

**Other Names**

| | | |
|---|---|---|
| CONSTANT | DATA | PROCEDURE |
| VARIABLE | FUNCTION | PROGRAM |

## PROMAL SELF-ADDRESSED LABELS

```
PROGRAM LABELS

INCLUDE LIBRARY

WORD LINES
WORD PASSES
WORD X
WORD Y
WORD P
WORD R
BYTE NAME[21]
BYTE ADDRESS[41]
BYTE CITY[21]
BYTE ST[3]
BYTE ZIP[10]
BYTE BUF[81]
BYTE INDEX
BYTE W

PROC LABELFORMAT
BEGIN
PUT "How many lines per label?",CR
GETL BUF
INDEX = STRVAL(BUF,#LINES)
END

PROC PRINTNUMBER
BEGIN
PUT "How many labels to print?",CR
GETL BUF
INDEX = STRVAL(BUF,#PASSES)
END

PROC READDATA
BEGIN
PUT "Enter full name--20 characters or less.",CR
GETL NAME,20
PUT "Enter address--40 characters or less.",CR
GETL ADDRESS,40
PUT "Enter city--20 characters or less.",CR
GETL CITY,20
PUT "Enter 2 character state code.",CR
GETL ST,2
PUT "Enter zip code--9 characters or less.",CR
GETL ZIP,9
END

PROC PRINT
BEGIN
R = OPEN("P",'W')
FOR X = 1 TO PASSES
  OUTPUTF R, "#S#C", NAME
  OUTPUTF R, "#S#C", ADDRESS
  OUTPUTF R, "#S ", CITY
  OUTPUTF R, "#S ", ST
  OUTPUTF R, "#S ", ZIP
  FOR Y = 1 TO LINES
    PUTF R, CR
CLOSE R
END

BEGIN

LINES = 0
PASSES = 0

LABELFORMAT
PRINTNUMBER
READDATA
LINES=LINES-3
X = 1
Y = 1
PRINT
END
```

There is no punctuation needed at the end of lines. A semicolon is used to designate a remark. In a line containing a semicolon, everything after the semicolon is ignored.

PROMAL's variables and other identifiers can have up to 31 characters, all of them significant, unlike BASIC which only looks at the first two characters. Although PROMAL's reserved words cannot be used as variables, they can be used within variables. For instance, TON is a legal variable even though it contains the reserved word TO. When compiled, these variables use no more memory than short variables, so highly descriptive variables aren't a liability.

Procedures and functions start with a name, followed by a BEGIN and then any local variables or definitions. Any looping segments are indented. Looping commands include IF/THEN, FOR, REPEAT/UNTIL, WHILE, and CHOOSE. The CHOOSE statement is similar to Pascal's CASE. Functions and procedures end with an END statement.

### UNIQUE COMMANDS

PROMAL has two unique statements available. ESCAPE allows you to jump out of a procedure or function if a problem is detected or you need to exit early. REFUGE is the place to which the program jumps. You are allowed up to three refuge locations. This is the closest to a GOTO that you will find in PROMAL.

### OUR SAMPLE PROGRAM

In order to stay consistent with the other segments of the series, we'll once again create our self-addressed labels program, this time using PROMAL (refer to listing at left). As in past installments, we'll use our four subroutines: labelformat, printnumber, readdata, and print. Since PRINT is not a reserved word in PROMAL, we are free to use it as a procedure name.

We start with the program name and then use the INCLUDE LIBRARY command, because we will need the library procedures for I/O. Next we have a *lot* of variables to declare.

You'll remember that WORDs are integers from 0 to 65,535. By defining some variables as WORDs, we prevent the use of negative numbers. LINES is used to hold the number of lines per label. PASSES holds the number of labels to print. X, Y, P, and R are used in the print procedure.

Since strings must be contained in arrays, we define NAME, ADDRESS, CITY, ST, ZIP, and BUF as being of type BYTE and follow each with the number of characters to be held. BUF is a temporary storage area, which we'll detail when we get to the procedures that use it. INDEX is used in conjunction with BUF.

There's a little idiosyncracy of PROMAL that you should know. In the declaration of the length of the array you must add one extra space for an end of array marker. This means that instead of declaring an array with two spaces for our state code, we must use three. You would not believe the headache that will result if you forget this. So remember it if you intend to use PROMAL at all.

The labelformat procedure uses the PUT procedure (found in the library that we included earlier) to print our prompt on the screen. GETL is short for "get line," and this we use to get the number of lines per label. GETL works similarly to INPUT in BASIC. One of the peculiarities of

PROMAL is that getting numbers (as opposed to letters) requires an extra step.

The input must be buffered and then converted to a number value using the STRVAL function (also found in the library routine). This function is a bit difficult to understand. If you remember the Pascal column, I mentioned that you "evaluate a function and execute a procedure." We would expect STRVAL to return the numeric value of the buffered characters. Instead, it returns the memory location where the value is stored. This adds an extra variable to our function.

INDEX is the variable (must be a BYTE variable) that points to where the value of LINES is stored. The function does store the value that we need in the variable LINES, so we can use that value later. It just goes about it a little strangely.

The printnumber routine uses the same function to obtain the PASSES value.

The readdata procedure uses the PUT and GETL procedures to obtain our values for NAME, ADDRESS, CITY, ST, and ZIP. While we defined our variables at the beginning and set the number of characters for our arrays, we must follow the variable name in each GETL statement with a comma followed by the number of characters of input to accept. This limits the input to prevent us from overrunning the variable's capacity.

The print procedure is a bit complicated. The R variable is used to designate a path for information flow. In this case, we open a channel to the printer ("P") in write access ('W') mode. We then use our two FOR loops to output each label's information the required number of times. Lastly, the procedure closes the channel to the printer.

There are two commands that can be used to send the information to the printer: OUTPUTF and PUTF. OUTPUTF allows a little more flexibility as to how the information is printed out. In the OUTPUTF statements you'll notice the #S and #C designators. These identify how the information is to be printed. #S stands for "print as a string of characters." #C stands for "print a carriage return." There are other designators for printing as a signed real number, an unsigned real number, or an unsigned integer value.

Unlike BASIC, PROMAL does not automatically end each printed line with a carriage return. Instead, these are added individually as needed. Notice the ,CR at the end of our prompt lines in the readdata procedure, for instance. In our OUTPUTF statements we must also add the carriage returns.

That covers the procedures used. The main body of the program sets the LINES and PASSES variables equal to 0. It calls the labelformat, printnumber, and readdata procedures. Before it can print the labels, we need to reduce the number of lines per label by three. As you recall, we use the variable LINES to determine the number of carriage returns we must place after our data to take us to the top of the next label.

In PROMAL, until you set a variable it contains a "garbage" value. So we must set X and Y equal to one before we execute our print procedure. This could have been done just below where we set LINES and PASSES equal to zero, but I was feeling lazy. That leaves only executing the print procedure, and the program's done.

## NEXT MONTH

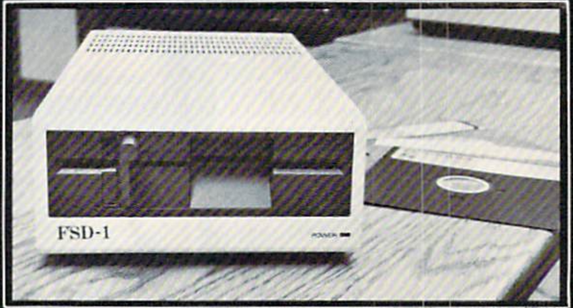
With next month's column heralding the approach of Christmas, I'd like to take a look at some nice presents you might want to buy for your computer. After all, you'll be buying presents for all your friends and relatives. While I've had my computers long enough to think of most of them as relatives, even those of you have only had yours a short while should have gotten a friendship started by now.

If there are any comments you'd like to make about the *Cadet's Column* or any criticisms you'd like to voice, send a letter via *Ahoy!* or stop in the two rooms where I hang out on PlayNET. The *For Starters* room is intended to help those who are just starting to use their computers, although we'll gladly answer any questions that come up. It's currently open on Sunday nights. My room, *Cherp's Library,* is open on Friday and Tuesday nights. If you need help finding articles or books on any particular topic, stop in and I'll check my collection and see what I can recommend. And don't forget the *Ahoy! Port of Call* on Saturday (moved from Thursday) nights. ☐

**PROMAL**
Systems Management Associates, Inc.
3325 Executive Drive
Raleigh, NC 27609
Phone: 919-878-3600

Demo: $10.00
Programmer's version: $49.95
Developer's version: $99.95
Add $5 for shipping and handling ($2.50 for demo).


**Commodore Compatible and only. . . $139.00**




**FSD-1 5¼"Disk Drive**

**Directly replaces the Commodore 1541 disk drive.**

The FSD-1 Disk Drive is a versatile and efficient disk drive built for the Commodore series of personal computers. This disk drive is fully compatible with the Commodore 64 computer and directly replaces the Commodore 1541 Disk Drive, giving much better performance in terms of data loading and writing speed and memory buffer size.

**Special Features**

- Full 6 month warranty—your assurance of quality
- Slim line construction—to fit in those smaller places
- Vented metal chassis—to run cool and efficient always
- Dual serial port with chaining option for expandability
- 5¼" industry standard format
- Positive lever lock—to eliminate the "pop out" problem
- Built especially for C-64 users

Remember, no sales tax in Oregon.

**To Order call toll free 1-800-356-5178**

Visa and MasterCard are welcome. Allow $8.00 shipping and handling. Or mail your order with check or money order to:

ECI

Emerald Component International
541 Willamette Street
Eugene, OR 97401
Tel. 503-683-1154

Reader Service No. 164

# COMMODORE 64 COMPUTER

**(Order Now)**

# $99.00

When you purchase Pocket Writer 64 $39.95

- C128 Disks 59¢ ea.*
- 13" Color Monitor $139.95

*CALL BEFORE YOU ORDER*

# COMMODORE 64 SYSTEM SALE

Commodore 64

Com. 1541 Disk Drive

13" Color Monitor

Plus $30.00 S&H

# $457

(Ltd. Qty)

# C128 Commodore Computer

# $299.00

- Voice Synthesizer $39.95
- 12" Monitor $79.95

*PRICES MAY BE LOWER*

### COMMODORE 64 COMPUTER $99.00

You pay only $99.00 when you purchase the Pocket Writer at $39.95 ($59.95 value) plus we pack a super sprecial software discount coupon with your order that allows you to save over !250 off of software sale prices. With only !100 of software savings applied, your net cost is $0.00

### * C128 DOUBLE SIDED DISKS 59¢ EA.

Get these 5¼" Double Sided Floppy Disks specially designed for the Commodore 128 Computer (1571 Disk Drive). 100% Certified, ***Lifetime Warranty***, Automatic Lint Cleaning Liner included. 1 Box of 10 - $5.90 (59¢ ea.), 5 Boxes of 10 - $29.50 (59¢ ea.), 10 Boxes of 10 -$59.00 (59¢ ea.).

### 13" COLOR MONITOR $139.95

You pay only $139.95 when you order this 13" COLOR MONITOR. LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your monitor that allows you to save over $250 off software sale prices!! With only $100 of savings applied, your net color monitor cost is only $39.95. (16 Colors).

### Premium Quality 150-170 CPS Comstar Aero 160 Printer $199.00

The COMSTAR Aero 160 gives you a 10" carriage, 150-170 CPS, 9 x 9 dot matrix with double strike capability for 18 x 18 dot matrix (near letter quality), high resolution bit image (120 x 144 dot matrix), underlining, back spacing, left and right margin setting, true lower decenders with super and subscripts, prints standard, block graphics and special characters. It gives you print quality and features found on printers costing twice as much!! (Centronics Parallel Interface) List $499.00 **Sale $199.00.**

### 9" SAMSUNG GREEN SCREEN MONITOR

Super High Resolution composite green screen monitor. Perfect for 80 column use with The C128 computer (Req. $19.95 Cable)
List $129.95 **Sale $59.95.**

### 80 COLUMNS IN COLOR POCKET WRITER 64 WORD PROCESSOR $19.95

This POCKET WRITER 64 WORD PROCESSOR is the finest available for the COMMODORE 64 computer! The ULTIMATE FOR PROFESSIONAL Word Processing, DISPLAYS 40 or 80 COLUMNS IN COLOR or black and white! Simple to operate, powerful text editing, complete cursor and insert/delete key controls line and paragraph insertion, automatic deletion, centering, margin settings and output to all printers! List $59.95. **SALE $39.95. *Ltd. Qty***

## SPECIAL SOFTWARE COUPON

**We pack a SPECIAL SOFTWARE DISCOUNT COUPON with every COMMODORE 64 COMPUTER, DISK DRIVE, PRINTER, or MONITOR we sell! This coupon allows you to SAVE OVER $250 OFF SALE PRICES!!**

**(Examples)**

### PROFESSIONAL SOFTWARE COMMODORE 64

| Name | List | Sale | Coupon |
|---|---|---|---|
| PaperClip | $59.95 | $34.95 | $29.95 |
| Consultant | $59.95 | $34.95 | $29.95 |
| Leader Board | $39.95 | $22.95 | $21.95 |
| The Print Shop | $44.95 | $27.95 | $25.95 |
| Bop'N Wrestle | $39.95 | $19.95 | $18.95 |
| Super Huey | $19.95 | $12.95 | $11.95 |
| Voice Command Module | $79.95 | $39.95 | $34.95 |
| Nine Princes in Amber | $32.95 | $20.95 | $19.95 |
| Super Bowl Sunday | $35.00 | $19.95 | $17.95 |
| Flip and File Disk Filer | $24.95 | $14.95 | $12.95 |
| Pro Joy Stick | $19.95 | $12.95 | $10.00 |
| PartyWare | $19.95 | $14.95 | $9.95 |
| Dust Cover | $ 8.95 | $ 5.95 | $ 3.95 |
| Financial Planner Sylvia Porter | $49.95 | $29.95 | $26.95 |
| Hardball | $29.95 | $17.95 | $16.95 |
| C64 Troubleshoot & Repair Guide | $24.95 | $12.95 | $10.95 |

*(See over 100 coupon items in our catalog)*

**Write or call for Sample SPECIAL SOFTWARE COUPON!**

# ATTENTION Computer Clubs

***We Offer Big Volume Discounts***

## CALL TODAY!

### PROTECTO WARRANTY

All Protecto's products carry a minimum 90 day warranty. If anything fails within 90 days from the date of purchase, simply send your product to us via United Parcel Service prepaid. We will IMMEDIATELY send you a replacement at no charge via United Parcel Service prepaid. This warranty proves once again that ***We Love Our Customers.***

### C128 COMPUTER $299.00

Now you can get the C128 computer for only$299 plus we pack a special software discount coupon with your order that allows you to save over $250 off software sale prices. With only $100 of software savings applied your net cost is $199.

### 340K 1571 COMMODORE DISK DRIVE $259.00

Double Sided, Single Disk Drive for C-128 allows you to use C-128 mode plus CPM mode. 17 times faster than 1541, plus runs all 1541 formats. List $349.00. **Sale $259.00.**

### SUPER AUTO DIAL MODEM $29.95

Easy to use. Just plug into your Commodore 64 computer and you're ready to transmit and receive messages. Easier to use than dialing your telephone, just push one key on your computer! Includes exclusive easy to use program for up and down loading to printer and disk drives. ***Best in U.S.A.*** List $99.00. **SALE $29.95.** *Coupon $24.95.*

### VOICE SYNTHESIZER $39.95

For Commodore-64 computers. Just plug it in and you can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies!! PLUS ($19.95 value) TEXT TO SPEECH program included FREE, just type a word and hear your computer talk — ADD SOUND TO "ZORK", SCOTT ADAMS AND OTHER ADVENTURE GAMES!! (Disk or tape.) List $89.00. **SALE $39.95**

### 12" SAMSUNG AMBER SCREEN MONITOR $79.95

Super High Resolution amber screen monitor. 80 columns x 24 lines, easy to read, a must for wordprocessing . Fantastic value.
List $129.00. **Sale $79.95.**
(C128 cable $19.95. C64, Atari cable $9.95)

### PRINTER/TYPEWRITER COMBINATION $199.95

Superb letter quality, daisy wheel printer/typewriter combination. Two machines in one — just a flick of the switch. Extra large carriage, typewriter keyboard, automatic margin control compact,lightweight, drop in cassette ribbon! (90 day warranty) centronics parallel interface Built -in. List $349.00. **SALE $199.95.** ***(Ltd. Qty.)***

### 14" RGB & COMPOSITE COLOR MONITOR $239.95

Must be used to get 80 columns in color with 80 column computers (C128 - IBM - Apple). (RGB Cable $19.95) Add $14.50 shipping.
List $399.00. **SALE $239.95.**

- LOWEST PRICES • 15 DAY FREE TRIAL
- BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL

**PHONE ORDERS**
8 a.m. - 8 p.m. C.S.T. Weekdays
9 a.m. - 12 noon C.S.T. Saturdays

- 90 DAY FREE REPLACEMENT WARRANTY
- OVER 500 PROGRAMS • FREE CATALOGS

Add $10.00 for shipping, handling, and insurance. Illinois residents please add 6½% sales tax. Add 20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice.

VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only.

# PROTECTO

***We Love Our Customers***

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

# Famous National Brand

Sale $39.95 List $199.00

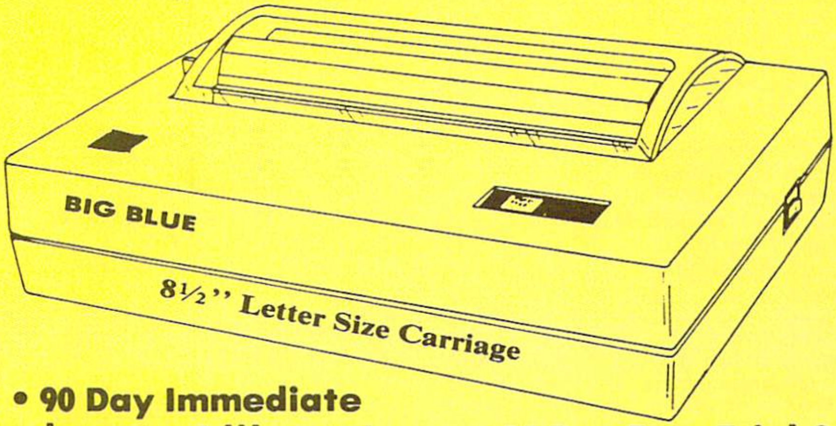
**Commodore® • Atari® • Apple® • IBM®**

**We Like this Printer so much We Bought Out the Factory.**

Sale $39.95 List $199.00

# 80 Column Printer Sale

**• Word Processing • Program Listings • Graphics • Quiet Operation • Upper and Lower case • All points addressable Graphics • Underline • Enhanced • Much much More**




## Super Print Quality

This printer was made by **Canon**® for one of the largest computer manufacturers in the world. The Big Blue printer comes ready to hook up to the serial port of the **IBM**®PC jr. Plus with low cost adapter cables you can connect the Big Blue printer to the **IBM**®PC, **IBM**®XT, **IBM**®AT, **IBM Compatibles**, **Apple**®II,IIe,IIc, **Apple Compatibles, Commodore**® 64,128, **Atari**®, plus many more. (Also VIC 20)

**• 90 Day Immediate Replacement Warranty**

**• 15 Day Free Trial-Satisfaction or Money Back**

Now you can have a full fledged 8½'' letter size 80 column printer for less than the cost of a large box of paper. This printer uses advanced thermal technology to print upper and lower case (with true lower descenders), underline, enhanced, all points addressable graphics (works with Printshop) plus More. Print out pictures, program listings, wordprocessing pages, graphics and more. Perfect for the homeowner or student and definitely affordable. Fantastic Printer at an unbeatable price. List $199.00 **Sale $39.95**

**Paper** (2 Rolls) List $19.95 **Sale $9.95**

**Intelligent Commodore Interface**— Allows you to connect the Big Blue printer to the printer port of the Commodore 64 and 128 computer. Print Commodore graphics, use Printshop, Word processors and more... List $49.95 **Sale $24.95**

**Intelligent Atari Interface**— Allows you to connect the Big Blue printer to Atari computers (except 1200). Print Atari graphics, Printshop ,word processors, and more... List $49.95 **Sale $24.95**

**IBM PC, AT, XT, PCjr®, Apple II, II+, IIc, IIe®, RS-232 Adapter** – Adapts the Big Blue printer to be used with any RS-232 port. List $19.95. Sale $9.95.

Apple IIe, Atari 520 ST, Laser 128, Amiga interface — List $24.95 **Sale $12.95**

IBM, Apple, Canon, Commodore, Atari are trademarks of International Business Machines, Apple Computer, Canon Inc, Commodore Business Machines, Atari Inc. Respectively.

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Reader Service No. 116

# Commodore Software Sale

**For more information send for a free catalog today!**

Phone Orders

Call 8 to 8 C.S.T.-M-F

(T) Tape, (C) Cartridge, (D) Disk

312-382-5244

## Games

**Access**

0118 Leader Board (D) .............. $23.95
0120 Courses for Leader Board (D) .... $13.95
6010 10th Frame (D) ................ $23.95
3033 Beachhead 2 (D) ............... $22.95
0451 Beachhead (D or T) ............. $17.95
0752 Raid Over Moscow (D) .......... $22.95
3500 Mach 5 (C) .................... $19.95
2128 Mach 128 (C) .................. $28.95

**Accolade**

6022 Ace of Aces (D) ................ $18.95
6024 Deceptor (D) .................. $18.95
5958 Dam Busters (D) ............... $18.95
5954 Fight Night (D) ................ $18.95
5950 Hardball (D) .................. $18.95
5952 Law of the West (D) ........... $18.95
5956 PSI 15 Trading Co. (D) ........... $18.95

**Avalon Hill**

5140 Black Thunder (D) ............. $14.95
0396 Super Bowl Sunday (D) .......... $19.95
5234 Season Disk (D) ............... $12.95
3572 Spitfire 40 (D) ................ $21.95
5252 Gulf Strike (D) ................ $18.95
5146 Jupiter Mission (D) ............. $21.95
2375 Computer Title Bout (D) ......... $19.95

**Blue Chip Software**

2060 Millionaire (D) ................ $16.95
5256 Baron (D) ..................... $16.95
6104 Tycoon (D) .................... $16.95

**Broderbund**

5986 Where is Carmen Sandiego (D) .. $21.95
2905 Karateka (D) .................. $19.95
2540 Print Shop (D) .................. $27.95
2542 Graphics Library 1,2, or 3 (D) ..... $15.95
2910 Companion (D) ................ $22.95
6090 Toy Shop (D) ................... $39.95

**Datasoft**

3025 Bruce Lee (D) .................. $18.95
3027 Conan (D) ..................... $9.95
5218 The Goonies (D) ............... $18.95
6026 Never Ending Story (D) .......... $18.95
6028 Mind Pursuit (D) ............... $18.95
5220 Zorro (D) ..................... $18.95
3028 Mr. Do (D) ...................... $9.95
3028 Dig Dug (D) ..................... $9.95
3032 Pole Position (D) ............... $9.95
3026 Pac-Man (D) ................... $9.95

**Sub-Logic**

6070 Flight Simulator II (D) ........... $31.95
6072 Jet (D) ........................ $26.95
6074 Football (D) ................... $27.95

**Electronic Arts**

3830 Dr. J & Larry Bird (D) ........... $12.95
5180 Heart of Africa (D) ............. $12.95
6038 Lords of Conquest (D) .......... $22.95
3601 Super Boulderdash (D) .......... $12.95
5192 Pinball Construction (D) ......... $12.95
3840 7 Cities of Gold (D) ............. $12.95
5910 Music Construction (D) .......... $12.95
5182 Movie Maker (D) ................ $22.95
5194 Racing Destruction (D) .......... $12.95
3842 Skyfox (D) .................... $12.95
3600 Touchdown Football (D) ........ $12.95
3633 Chessmaster (D) ............... $26.95
3632 Golden Oldies (D) .............. $19.95
6098 Amnesia (D) .................. $26.95
6100 Ogre (D) ...................... $26.95

**Epyx**

0338 Winter Games (D) .............. $23.95
1556 Movie Monster (D) ............. $23.95
6065 Super Cycle (D) ............... $23.95
6092 World Games (D) .............. $24.95
5210 World Karate Champ (D) ....... $17.95
0337 W.G. Football (D) .............. $22.95
0068 Fast Load (C) .................. $22.95
6094 Destroyer (D) .................. $23.95
6096 Championship Wrestling (D) .... $23.95

**Strategic Simulation Inc.**

1561 Battle of Antietam (D) .......... $31.95
3020 Computer Ambush (D) ......... $35.95
3018 Computer Quarterback (D) ..... $23.95
6002 Gettysburg (D) ................ $35.95
1565 Mech Brigade (D) ............. $35.95
6036 Nam (D) ...................... $23.95
3031 Field of Fire (D) ................ $23.95
1567 Battle Group (D) ............... $35.95
5154 Kampfgruppe (D) .............. $35.95
3010 Imperium Galactum (D) ......... $23.95
3017 Broadsides (D) ................ $23.95
3788 U S S A F (D) ................. $35.95

**Telarium**

3065 Fahrenheit 451 (D) ............ $12.95
3066 Rendezvous with Rama (D) ...... $12.95
3067 Dragonworld (D) ............... $12.95
3068 Amazon (D) ................... $12.95
5064 Nine Princes in Amber (D) ...... $21.95
6102 Agatha Christie (D) ............ $21.95
5066 Perry Mason (D) ............... $21.95

**Data East**

6008 Commando (D) ................ $21.95
1552 Karate Champ (D) ............. $21.95
1551 Kung Fu Master (D) ........... $21.95

**Windham Classics**

3081 Alice in Wonderland (D) ......... $9.95
3080 Below the Root (D) .............. $9.95
3079 Swiss Family Robinson (D) ....... $9.95
3087 The Wizard of Oz (D) ............ $9.95

## Educational

**Fisher Price**

3095 Alpha Build (C) ................. $4.95
3070 Dance Fantasy (C) .............. $4.95
3069 Linking Logic (C) ............... $4.95
3072 Memory Manor (C) ............. $4.95
3073 Logic Levels (C) ................ $4.95

**Designware**

5100 Algebra 1,2, or 3 (D) ........... $19.95
2518 Body Transparent (D) .......... $26.95
2517 European Nations (D) .......... $26.95
0824 Grammar Examiner (D) ......... $26.95
0832 States & Traits (D) ............. $26.95

**Spinnaker**

5300 Alphabet Zoo (C) .............. $4.95
5090 Delta Drawing (C) .............. $4.95
5301 Facemaker (C) ................ $4.95
5303 Kindercomp (C) ................ $4.95
3077 Number Tumblers (C) ........... $4.95
3078 Sea Spellers (C) ................ $4.95
3076 Up & Add 'Em (C) .............. $4.95

**Weekly Reader**

2515 Stickybear ABC (D) ............ $14.95
5130 Stickybear Math (D) ........... $14.95
2512 Stickybear Numbers (D) ........ $14.95
5132 Stickybear Reading (D) .......... $14.95
5126 Stickybear Spellgrabber (D) ..... $14.95
5129 Stickybear Typing (D) .......... $14.95
5128 Stickybear Townbuilder (D) ..... $14.95

**Hayden**

2160 Sargon II (D) ................... $9.95
0261 SAT Math (D) ................. $14.95
0262 SAT Verbal (D) ................ $14.95
2164 SAT Sample Tests (D) .......... $14.95

**American Educational Computer**

2493 Grammer Word Use (D) ......... $9.95
2499 Biology Facts (D) ............... $9.95
2521 AEC Spelling (D) .............. $19.95
2496 French Vocabulary (D) .......... $9.95
2495 Spanish Vocabulary (D) .......... $9.95
3747 Learn to Read (D) ............. $19.95
3745 Phonics (D) .................. $19.95
2519 U.S. Geography (D) ............. $9.95
2520 U.S. Goverment (D) ............ $9.95
2498 U.S. History (D) ................ $9.95

## Business

**C128 Software From Timeworks**

5022 Word Writer (D) .............. $49.95
5024 Data Manager 2 (D) ........... $49.95
3048 Sylvia Porter (D) ............... $49.95
5030 Partner (C) ................... $49.95
5026 SwiftCalc/Sideways (D) ........ $49.95

Add $10.00 for shipping, handling, and insurance. Illinois residents please add 6½% sales tax. Add 20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice.

VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only.

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Reader Service No. 116

# Famous Comstar National Brand

# 10" Printer Sale

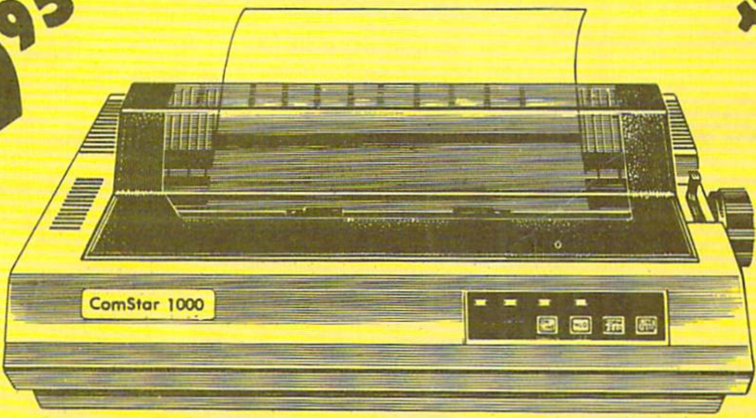
## Includes Commodore Interface

*Near Letter Quality* **Interface** *Near Letter Quality*

## Best Value in the USA

**• 100 CPS draft/20CPS near-letter quality • Dot Addressable Graphics • Adjustable Tractor and Friction Feed • Automatic Paper Loading • Right and Left Margin settings • Pica, Elite, Condensed, Italics • Superscript • Subscript • Underline, Bold print, Double Strike • Superb NEAR LETTER QUALITY**

**$179.95**




**$179.95**

**Easy to Use**

**Fantastic Graphics**

**2 Year Warranty**

The Comstar 1000 is one of the best values in the United States today. Print your letters, documents, programs, pictures, and more at a blazing 100 Characters Per Second or 20 cps in the Near Letter quality mode. ( Looks just like it came from a typewriter. ) Plus, choose your printing mode (NLQ, Draft) from your wordprocessor or by simply pushing the controls on the front panel. Fantastic Quality at a Fantastic Price. List $349.00 **SALE$179.95.**

**Print Method**
Serial impact dot matrix (9 pin)
**Print Speed**
Draft- 100 CPS NLQ- 20 CPS
**Character Sets**
96 ASCII Characters, Marker, Symbols (includes italic font)

**Ribbon (Life exp.)**
Black: cassette (2.5 million characters)
**Dimensions**
15.4 (W) x 10.9 (D) x 4.7 (H) inch
**Weight**
Approx. 10 lbs
**Character Spacing**
Fixed

**Line Spacing**
1/6, 1/8, 7/72, and 1/216 inch
**Paper Feed**
Adjustable tractor and friction feed
**Paper feeding Direction**
Bi-directional
**Copies**
2 plus original

**Supply is Limited so Buy Today**

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

**PROTECTO**
*We Love Our Customers*
22292 N. Pepper Rd., Barrington, Illinois 60010
**312/382-5244 to order**

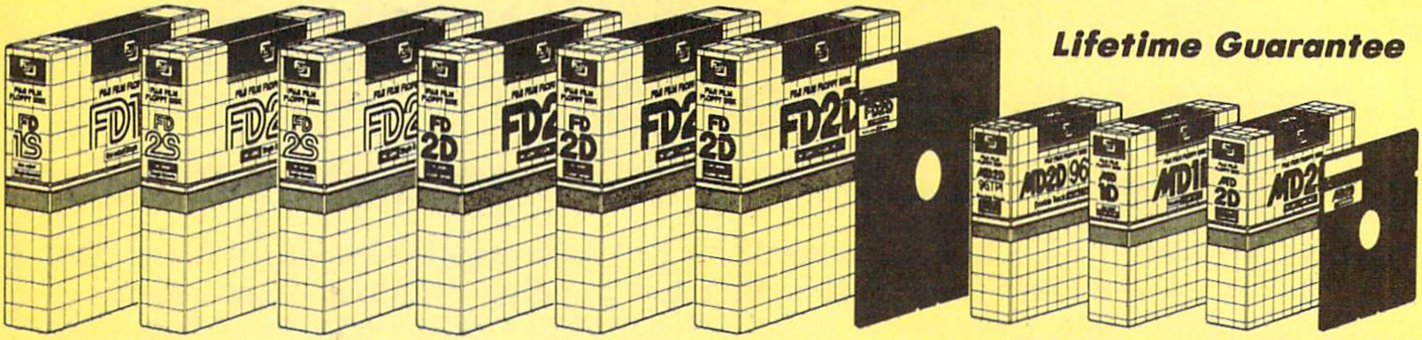
Reader Service No. 116

# *Special Buy - One Time Only Pricing*

# FUJI Floppy Disk SALE 49¢ ea.

List $2.95

## *Premium Quality Floppy Disks*



*Lifetime Guarantee*

List $29.95

**Box of 10** *with hub rings, sleeves and labels* **One Time Only Sale $4.90** Per Box/10

Famous Brand FUJI Floppy Disks for those who care about keeping their data.

**Single Sided — Double Density** for Commodore 64, Atari, Apple

**Super Special Deal Box of 10** Net Cost **49¢ ea.**

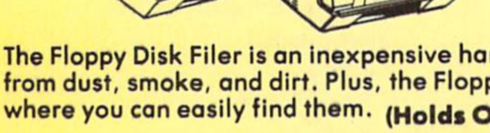
**No Limit, Dealers Welcome**

---

*** $12.95** ☆ ☆ ***Flip-N-File*** ☆ ☆ *** $12.95**

**Flip/Sort**

# Floppy Disk Filer



## *Everyone Needs a Floppy Disk Secretary*

**Facts:**

- Dust and Dirt particles can hurt your disks
- Most disks go bad due to mishandling in storage
- Proper filing of your disk collection will reduce unnecessary handling of your disks

The Floppy Disk Filer is an inexpensive hard plastic Fliptop case that will allow for easy filing, and protect your disks from dust, smoke, and dirt. Plus, the Floppy Disk Filer will keep all your disks out of unwanted hands and in one place where you can easily find them. **(Holds Over 50 Disks)**

List $24.95 **Introductory Sale Price $14.95** **** Coupon $12.95***

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6¼% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

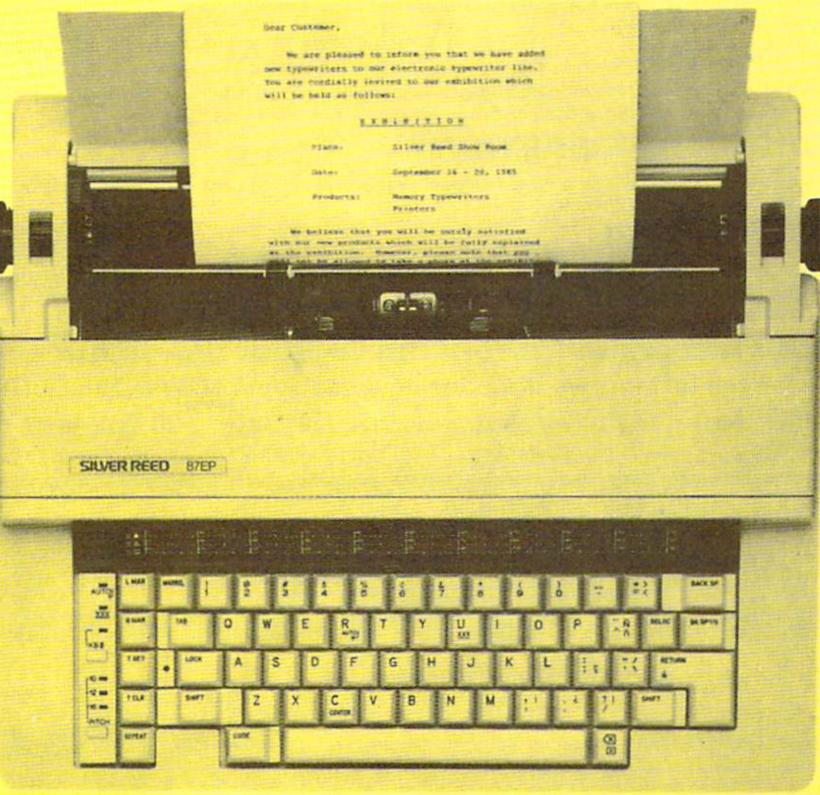
Reader Service No. 116

# Daisy Wheel Printer/typewriter

## Students • Teachers • Business • Home Users

**• Superb computer business printer combined with the deluxe electronic typewriter • Two machines in one — just a flick of the switch • Superb Letter Quality correspondence • 12" Extra Large carriage • Drop in cassette Ribbon • Precision Daisy Wheel printing • Key in Buffer • Centronics Parallel interface**

**Sale $199.95**




**Sale $199.95**

Now you can have the advantages of a letter quality Daisy Wheel printer and the convenience of a typewriter for one low cost. Use your wordprocessor to type the letters, then with just a flick of the switch, your typewriter can type the envelopes. This is a fantastic Printer and a fantastic Typewriter. Every student and home business needs this machine. List $299.00 **Sale $199.95**

**Printer:**

| | |
|---|---|
| Paper width | 12 inches |
| Printing width | 10 inches |
| Cassette ribbons | Correctable film, one-time film, and fabric |
| Correcting tapes | Lift-off and cover-up |
| Line space lever | 0,1,1-½,and 2 |
| Keyboard selector | I and II |
| Print pitch | 10,12, and 15 |

**Keyboard:**

| | |
|---|---|
| Keys/characters | 44/96 |
| Automatic carrier return | |
| Automatic correction | 25 ch. |
| Automatic underline | |
| Relocate key | |
| Tabulation | |
| ½ back space key | |

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Reader Service No. 116

# FLOPPY DISKS SALE *39¢ ea.

## Economy Model or C-128 Cadillac Quality

***We have the lowest prices!***

***ECONOMY DISKS** For use with Commodore 64, Atari, Apple.

Good quality 5¼" single sided double density with hub rings.

| | | | | |
|---|---|---|---|---|
| Bulk Pac | 100 Qty. | 39¢ ea. | Total Price | $39.00 |
| Box w/ sleeves | 10 Qty. | 79¢ ea. | Total Price | 7.90 |

# ☆ C-128 Computer Disks ☆

**CADILLAC QUALITY (Double Sided, Double Density)** ***Specifically designed for use with C-128***

***• Each disk certified • Free replacement lifetime warranty • Automatic dust remover • Works with IBM PC***

For those who want cadillac quality we have the C-128 Floppy Disk. Used by professionals because they can rely on C-128 Disks to store important data and programs without fear of loss! Each C-128 disk is 100% certified (an exclusive process) plus each disk carries an exclusive FREE REPLACEMENT LIFETIME WARRANTY. With C-128 disks you can have the peace of mind without the frustration of program loss after hours spent in program development.

**DOUBLE SIDED 59¢ Each**

### 100% CERTIFICATION TEST

Some floppy disk manufactures only sample test on a batch basis the disks they sell, and then claim they are certified. Each C-128 disk is individually checked so you will never experience data or program loss during your lifetime!

### FREE REPLACEMENT LIFETIME WARRANTY

We are so sure of C-128 Disks that we give you a free replacement warranty against failure to perform due to faulty materials or workmanship for as long as you own your C-128 disk.

### AUTOMATIC DUST REMOVER

Just like a record needle, disk drive heads must travel hundreds of miles over disk surfaces. Unlike other floppy disks the C-128 smooth surface finish saves disk drive head wear during the life of the disk. (A rough surface will grind your disk drive head like sandpaper). The lint free automatic CLEANING LINER makes sure the disk-killers (dust & dirt) are being constantly cleaned while the disk is being operated.

***C-128 Disks are definitely the Cadillac disk in the world***

Just to prove it even further, we are offering these super LOW INTRODUCTORY PRICES

**1 Box of 10 — $5.90 (59¢ ea.) 5 Boxes of 10 — $29.50 (59¢ ea.) 10 Boxes of 10 — $59.00 (59¢ ea.)**

0029 Paper Economy Sleeves (10) 50¢ 0030 Paper Economy Sleeves (100) $5.00

## ☆ ☆ COMMODORE 64 ☆ ☆

# PARTY QUIZ ONLY $14.95

## *Trivia Controller & Software*

Discover a better way to learn while you play, at a new, low price. Learning and entertainment are probably the reasons you bought a home computer. We've created a new, unique hardware/software system, like nothing ever produced for home computers, that satisfies those two motivations. It's called PQ, The Party Quiz Game. Included in each package are four special controllers (one for each player), a program disk and General Edition 1 disk containing 2700 questions covering a variety of subjects. PQ's Question / Answer Library (6 optional packages) expands the total number of questions to over 18,000. PQ asks the players a question; all are allowed to respond at once. Points are awarded for correct answers which are displayed on screen after a time elapses. All age and education levels, from reading age on up, can play thanks to PQ's "handicap" feature. Find out for yourself why Party Quiz gets 4 star ratings. List $49.95. **Sale $14.95.**



***PQ's four exclusive Quick Response™ controllers free players from keyboard captivity.***

### Additional Trivia Software Modules

| | List | Sale |
|---|---|---|
| General Edition 2,3 (specify) | $39.95 | $12.95 |
| Sports Edition | $39.95 | $12.95 |
| Education Edition | $39.95 | $12.95 |
| Bible Edition | $39.95 | $12.95 |
| Entertainment Edition | $39.95 | $12.95 |

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

# PROTECTO

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

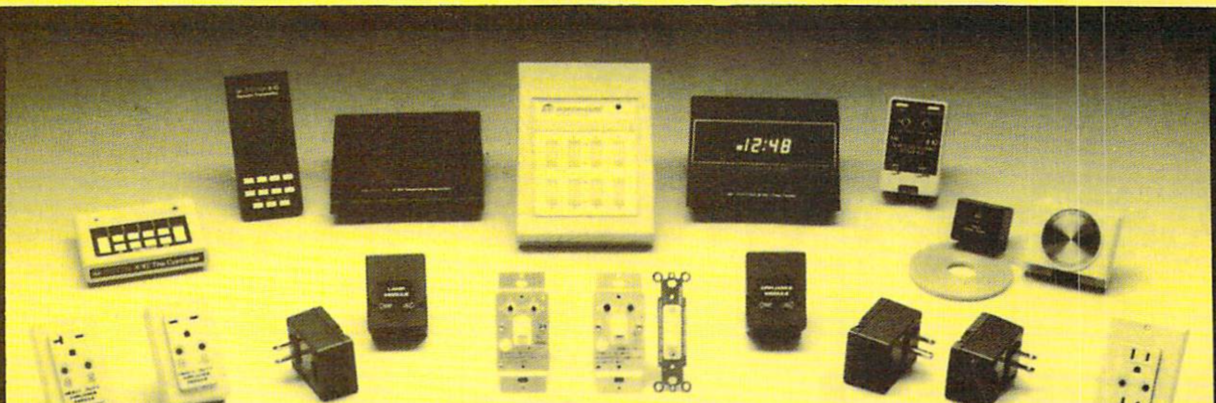

Reader Service No. 116

# Home Control

*Protect Your Home* — *Save On Utilities* — *Regulate Appliances and More!!*

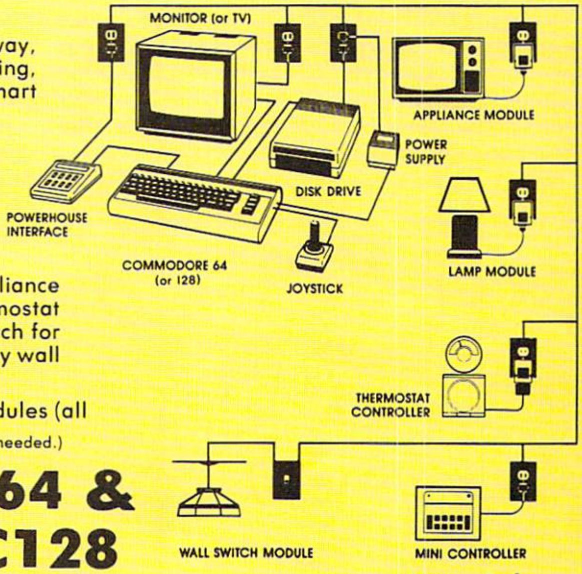
## Controls Lights, Appliances, Thermostats, and More Throughout Your Home for Added Convenience, Security, Safety, and Energy Savings. Without Tying Up Your Computer

**$49.95** **$49.95**




Free Lamp Module ($19.95 value) with purchase of X-10 computer interface.

The X-10 POWERHOUSE Computer Interface is programmed from your Commodore 64 or 128. You can then turn off your computer or use it for something else. It does not tie up your computer. The software shows a graphical representation of your home and allows you to select a room, then select a light or appliance to be controlled, all just by pointing with the joystick. The interface sends digital signals over your existing house wiring to control your lights and appliances which are connected to plug-in modules (sold separately) List $99.95. **Sale $49.95.**




It can wake you up to stereo or TV news. Light up your bedroom, hallway, bathroom. Start the coffee, start your central heating or air conditioning, warm up the curlers, all before you even get out of bed. But it's smart enough not to wake you up on weekends. At night it can lower the heat, play music or your favorite late night TV show for as long as you want, and can first dim and later turn out the lights automatically.

Many types of modules are available including appliance modules for TV's, hi fi's, coffee pots, etc. Lamp modules which contain a dimmer and can be used for incandescent lamps up to 300 watts. Wall switch modules which also contain a dimmer and can be used for incandescent outside lights and ceiling lights of up to 500 watts. 220V heavy duty appliance modules for 220V air conditioners and water heaters. The thermostat controller for central heating and air conditioning. The 3 way wall switch for controlling incandescent lights operated by two switches. The heavy duty wall receptable module to replace your existing wall receptable, etc.

Plus, works with BSR, GE, Leviton, Radio Shack, and Sears Roebuck modules (all 256 codes addressable). (Price does not include modules, please order modules as needed.)

## Control Modules

| | List | Sale |
|---|---|---|
| Lamp Module — 300 W incandescent | $19.95 | **$14.95** |
| Wall Receptacle — replacement outlets | $24.95 | **$19.95** |
| Wall Switch — turn on/off dim/brighten | $19.95 | **$14.95** |
| 3 Way Wall Switch — incandescent lights, for lights controlled by 2 or more wall switches | $24.95 | **$19.95** |
| Thermostat Controller — controls your existing thermostat | $39.95 | **$29.95** |

## C64 & C128

| | List | Sale |
|---|---|---|
| 2 Pin Appliance Module, up to 500W appliances | $19.95 | **$14.95** |
| 3 Pin Appliance Module, up to 500W appliances | $19.95 | **$14.95** |

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

## PROTECTO

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

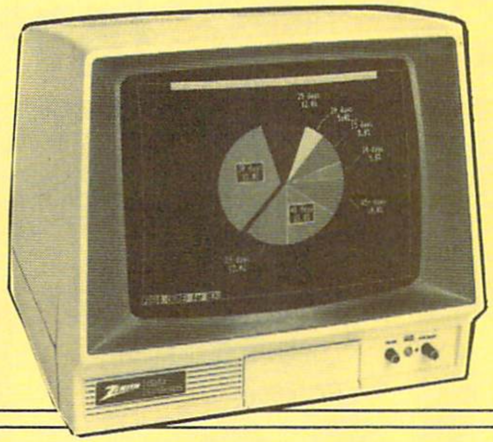
**312/382-5244 to order**

# Computer Cleaners

*Your Choice*
Reg. $19.95
*Sale $9.95*

## ½ PRICE SALE

*Your Choice*
Reg. $19.95
*Sale $9.95*



## TV/MONITOR SCREEN RESTORER & CLEANING KIT Sale $9.95

Reduce eye fatigue by increasing the clarity of your TV or monitor screen. This kit contains a hard wax formulation to cover surface imperfections on TV screens and monitors. This restores maximum optical clarity, making what you see more distinct. Plus high absorbency cloths and an auto static spray cleaner allows you to clean your screen on a regular basis to keep your screen looking better than new. (This is a must for those who watch monitors or TVs for extended lengths of time.) List $19.95. **Sale $9.95.**

## DISK DRIVE CLEANER

Reg. $19.95.
**Sale $9.95**




- 60% of all drive downtime is directly related to poorly maintained drives.
- Drives should be cleaned each week regardless of use.
- Drives are sensitive to smoke, dust & all micro patricles.
- Systematic operator performed maintenance is the best way of ensuring error free use of your computer system.

This unique twin slot jacket design gives twice as many "wet-dry" cleanings per rotation as other leading brands. Non abrasive, 100% lint free, random fiber cleaners capture dust, smoke particles and disk oxide build up which insures you against disk and data loss from dirty disk drive heads just like you must clean your albums and tape players you must clean your disk drive heads to keep your disk drive working well. (24 cleanings per kit.) List $19.95. **Sale $9.95.**




## ANTI-STATIC KEYBOARD CLEANER Sale $9.95

Now you can clean your computer keyboard fast, efficiently, and safely. The keyboard cleaning solution is exclusively formulated to remove skin oils, dust, and dirt that can destroy your equipment. Plus this non residue solution with anto-static properties will not build up like ordinary household cleaners so you can clean as much as you like without worry. Plus the lint free, high absorbency, non-abrasive cloths will not scratch or mar your equipment as they pick up dirt and grime in a matter of seconds. List $19.95. **Sale $9.95.**

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

**PROTECTO**
*We Love Our Customers*
22292 N. Pepper Rd., Barrington, Illinois 60010
**312/382-5244 to order**

Reader Service No. 116

# Color Monitor Sale

Sale

16 COLORS




*(Premium Quality)*

- Built in Speaker & Audio
- For Video Recorders
- For Small Business Computers
- Apple - Commodore -Atari - Aplus 3000 -etc.
- One Year Warranty'

*(Premium Quality)*

- Beautiful Color Contrast
- High Resolution
- Sharp Clear Text
- Anti-Glare Screen
- 40 Columns x 24 Lines
- Front Panel Controls

List $329.00

Sale $139.95*

Add $14.50 Shipping

80 Columns **RGB** Super High Resolution

## 13" Color Computer Monitor'

*C64/Atari composite cable $9.95

* C128 RGB/Composite 80 column cable $19.95.

## 14" RGB & Composite Color Monitor

Allows use of C-128 and C64 mode - composite and 80 column RGB mode. Must be used to get 80 columns in color with 80 column computers. Specially designed for use with the C128's special composite video output, plus green screen only option switch. (add $14.50 shipping)

List $399.00 Sale $239.95*

## 12" 80 Column Green/Amber Monitor

Super high resolution composite green or amber screen monitor. 80 columns x 24 lines, easy to read. Fantastic value. Limited Quantities.

List $129.00 Sale $79.95*

## 9" Samsung Hi Res Green Screen Monitor

Super High Resolution 80 column monitor perfect for Apple & Laser 3000/128 computers. Fantastic Value. Very Limited Quantities.

List $129.95 Sale $59.95*

## Turn Your Monitor into a TV Set Without Moving Your Computer

Elegant TV Tuner with dual UHF/VHF selector switches goes between your computer and monitor. Includes mute, automatic fine tuning and computer-TV selector switches. Inputs included for 300 ohm, 75 ohm, and UHF. Can be used with cable TV and VCR's. Fantastic Value. Limited Quantities. (Includes loop antenna for UHF & RCA connecting cables) (Add $3.00 Shipping. Plus $3.00 for APO/FPO).

List $129.95 Sale $49.95

***15 Day Free Trial - 90 Day Immediate Replacement Warranty***

*• LOWEST PRICES • BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL • OVER 500 PROGRAMS • FREE CATALOGS*

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, and ALASKA orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & Availability subject to change without notice.

VISA — MASTER CARD — C.O.D. C.O.D. on phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

# Rated No. 1 in Computer Education

## DesignWare

*Commodore 64*
**SALE**

## Blue Chip

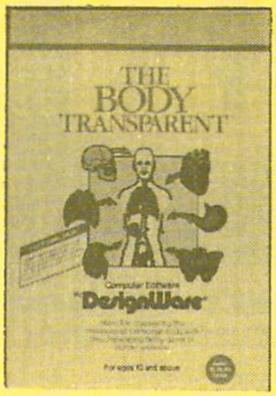
**European Nations and Locations** — An exploration of the continent that combines important facts and information in a challenging game format. The only European geography program that allows you to add questions of your own. If you miss a question during game play it is recycled to guarantee learning. Each game, you move nations to the proper location on a map of Europe. The map fills in with color as questions are correctly answered. Fast answers are rewarded with bonus points. Winner of the Parents Choice Award. (Disk)
List $44.95 **SALE $26.95**




**Tycoon** — It takes an individual with loads of confidence and driving ambition, to deal in the commodities marketplace. To foresee market trends and develop a plan of action before trading, are talents that can make or break you as you deal in precious metals, oil, grains and other items of necessity. Armed with charts and details from real-life situations of the past, you can research the market and make your move accordingly. The element of risk makes the game play a real challenge for all aspiring tycoons, or even established entrepreneurs. (Disk)
List $29.95 **SALE$16.95**




**The Body Transparent** — Learn basic anatomy as you play a game of facts and functions of the human body. Choose a male or female body and move bones and organs to their location. Then learn what the body parts perform. Find out where food is digested, the importance of kidneys and much much more. Add your own biology questions to help make homework fun or to challenge a friend. The game has multiple difficulty levels and bonus points for fast answers, plus color graphics. (Disk)
List $44.95 **SALE $26.95**




**Baron** — If you were given the opportunity to invest in real estate with a complimentary sum of money, say $35,000 and a time limit of 52 game -weeks to turn that into a million, how would you proceed? Baron is a program that offers you the chance to find out what your chances of success in this complicated venture will be. You must utilize the allocated funds wisely in buying, selling and developing land because real life influences like flunctuating mortage rates and other headaches that affect property owners will be apparent during play. It's challenging and risky to win the title of Baron (Disk)
List $29.95 **SALE $16.95**




**States & Traits** — A valuable learning tool for geography and history students. Learn basic geography and then go on to find out interesting facts about every region in the country. Find out where historical events happened on the map. As you play quick answers are rewardedwith bonus points. In the "States" part of the program you must move states into the right place on the map and the state lights up in bright color. In "Traits" you identify state capitals and landmarks. You can also design your own games (Disk)
List $44.95 **SALE $26.95**




**Millionaire** — Put yourself in high gear and join the risk takers, because you are about to experience the New York Stock Exchange. To get you started in investments you are given $10,000 and 154 stocks from 5 industry categories, the rest is up to you. Learn the market as you are faced with influences based on true to life events, good judgement is essential to whether you buy or sell and the status of your personal portfolio depends on making the right choices. The play includes and introduction to buying-on-margin, call options, put options and borrowing against your net worth. (Disk)
List $29.95 **SALE $16.95**




*Commodore 64*
**SALE**

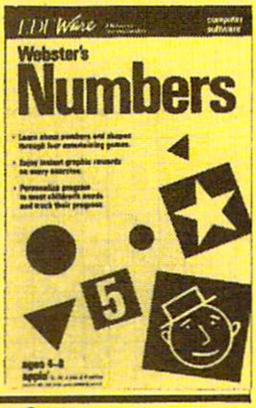
## EduWare

*Commodore 64*
**SALE**

**Algebra 1,2, or 3** — An introduction to Algebra concepts and definitions. Helps students master the fundamentals of first year Algebra, addition of real numbers, multiplication of real numbers, solving equations, solving inequalities and absolute value sets. Students can learn in 4 ways: They can work the sample problems, read discussions of concepts, watch equations being solved, or study rules that govern mathematic operations. The result is that the student creates a learning process that he or she is most comfortable with. (Disk)
List $39.95 **SALE $19.95**




**Webster's Numbers** — Introduce your young children to basic arithmetic concepts with this program that combines lively animation with four action games. For children with minimal reading skills, they will learn shape discrimination, eye-hand coordination, number recognition and sequential counting to name just a few. Children will delight in maneuvering a hot air balloon, leading a mosquito to safety and pushing blocks and triangles into different shapes. (Disk)
List $39.95 **SALE $19.95**




# ☆ ☆ Britannica Learning Companies ☆ ☆

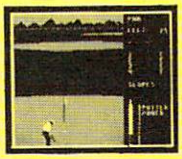
C64 **Super Sale!! Save On** C128

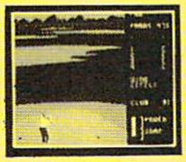
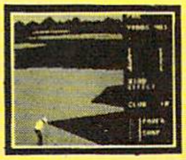
# Access Software

***Best Multi Level Graphics Games in the U.S.A.***



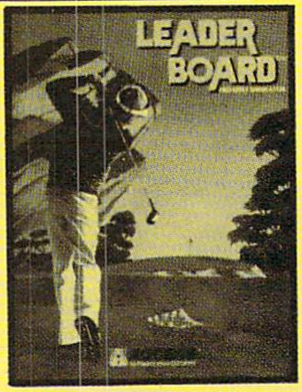

## No. 1 Golf Game



**Leader Board** — This is not just another golf program, it is the most realistic one on the market because it is really a simulator that allows true perspective of the game. Three levels of play take you from beginner to pro. The courses are difficult and require concentration to come in under par. (Disk) List $39.95. **Sale $23.95.** *Coupon $22.95.*

**Disk No. 1 — Courses for Leader Board.** Four different golf courses are on this disk of varying degrees of difficulty. List $19.95. **Sale $13.95.**





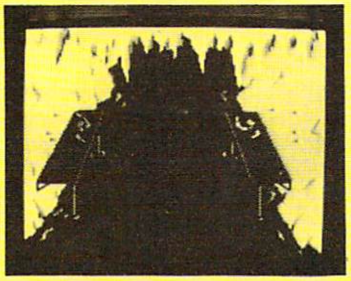


## Disk Drive Speeder-Uppers

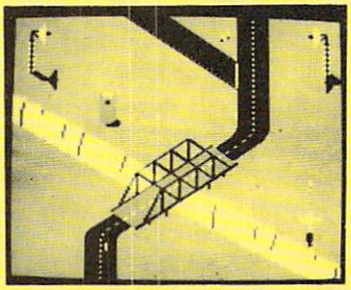
**Mach 5** — Plug Mach 5 into the cartridge port and turn on the computer, the cartridge works automatically to load programs up to 5 times faster than normal. Loads 99% of all software, even copy protected games. Works with all popular printers. Will list directories without disturbing programs in memory. Commands such as LOAD, SAVE, OPEN etc. are executed with one keystroke. More features than most other "fast loaders". Does not disturb RAM. (Cart.) List $34.95. **Sale $19.95.**

**Mach 128** — This "fast loader" will load programs up to 500% faster on the 1541 disk drive or the 1571 drive in 1541 mode, plus it has features that make it one of the best on the market. A full help menu, screen dump, 95% compatibility, 10 second formatting, plus much, much more. (Disk) List $49.95. **Sale $28.95.**



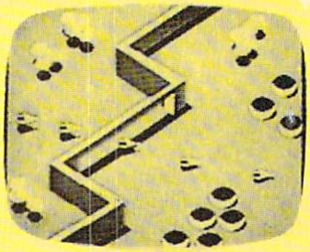
**Beachhead II** — Fantastic hi-res scrolling screens will lead you to new levels of excitement. Three scenarios, each with fantastic scrolling screens, add great realism to the game. First you maneuver your helicopter past tanks and artillery to the fortress wall. Then you must time your moves quickly as you go through the opening and closing gates. Scene 2 starts after you drop your paratroopers and make your way to the dictators machine gun emplacement. You must attack the dictator and rescue his hostages. Finally in Scene 3 you have the final confrontation plus you can be the rescuer or the dictator and play against an opponent or the computer. Fantastic two player Head to Head action. Highly recommended. (Disk) List $49.95. **Sale $22.95**



**Beach Head** — Multi Screen computer graphics at its finest. First you must maneuver your fleet through the mine laden channel while torpedoes are fired at you from all sides. Next you must engage the enemy planes with your anti-aircraft guns (best scenario graphics anywhere). Then you must sink the enemy fleet before they sink you. Next you maneuver to the beach head where your tanks must get through an obstacle course and finally fight the ultimate battle at Headquarters. All scenes in stunning 3-D graphics. List $39.95. **Sale $17.95.** (Disk or Tape.)




**Raid over Moscow** — The ultimate in multi screen computer graphics has arrived. (over six screens) The Soviets have launched an attack. First you must locate and destroy the ICBM missiles from your Stealth Bomber, then you must lead your squadron through the Soviet terrain to the Kremlin itself. Destroy the defenses, then destroy the defense center and finally the attack operations themselves. Fly planes, launch grenades, shoot bazookas. Super Fantastic Graphics, Sound, Animation. List $39.95. **Sale $22.95.** (Disk.)



Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Reader Service No. 116

EPYX COMPUTER SOFTWARE

**Commodore 64**

**ORDER NOW**

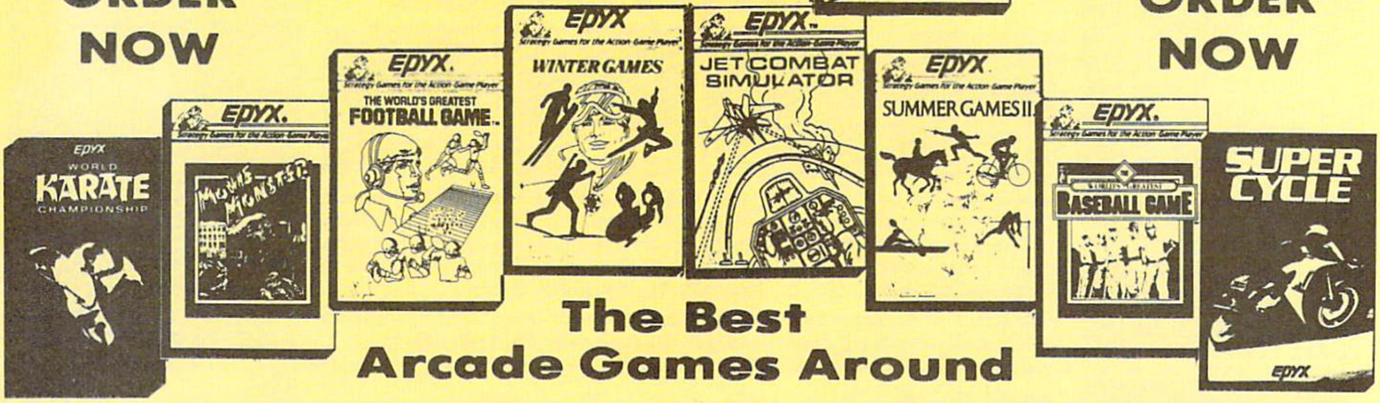
**Fast Load Cartridge** — Load, save and copy disks five times faster than normal. It plugs into the cartridge port of the Commodore 64 and goes to work automatically loading disks with ease. And that's only the beginning. It can copy a single file, copy the whole disk, send disk commands, and even list directories without erasing programs stored in memory. (Cartridge). List $39.95. **Sale $22.95.**




EPYX COMPUTER SOFTWARE

**Commodore 64**

**ORDER NOW**




## The Best Arcade Games Around

**World Karate Championship** — Become a Karate master! You must prove your ability as you earn your belts. Travel to four different cities to fight a series of opponents. There are 14 controllable moves, including kicks, blocks and front flips. The opponents become progressively tougher as skills improve. Start as a "white belt" in this exciting martial arts challenge. The character on-screen is realistic right down to facial expressions. Excellent graphics and background music. (Disk) List $34.95. **Sale $18.95.** *Coupon $17.95.*

**Super Cycle** — Experience the excitement and danger of motorcycle racing. Lean into the turns and cruise through the scenic Grand Canyon or the Rocky Mountains, as you race cross country. Measure your speed with your tachometer and speedometer. All the instruments are realistic. Features eight different courses, day and night racing and obstacles to challenge the driver, like road barricades, oil slicks and ice. The competition is stimulating and the graphics are first rate. (Disk) List $39.95. **Sale $23.95.**

**The World's Greatest Football Game** — This one has it all — strategy, action, three views of the field. It's in a class all its own! Finally, a football game that not only puts you on the field, but also on the sidelines in the coach's shoes. Use the "Playbook" or design your own offensive and defensive plays. Then, grab the joystick and put your strategy to the test. You control key players to run a sweep, make a tackle, throw a pass and even kick a fieldgoal. All the action and all the strategy make this your favorite football game. (Disk) List $39.95. **Sale $22.95.**

**Winter Games** — Experience the challenge of six winter sporting events. In the Bobsled, you're right in the tube careening along the walls. At the SkiJump, you control your form in take-off, flight and landing. In Figure Skating, timing counts for the transitions, the jumps and landings. Choreograph your own routine in Free Style Skating. Hot Dog Aerials push your agility to new heights. The Biathlon challenges your endurance in cross-country skiing. There's even an opening ceremony, complete with national anthems. One to Eight Players.
(Disk) List $39.95. **Sale $23.95.**

**Jet Combat Flight Simulator** — Flight simulation programs are the most requested in the country. The key to a good one is realism, the sensation of being in the cockpit — guiding the plane through take-offs, landings and air to air — air to ground combat. You are an Air Force pilot and your mission is critical. Your success in completing your orders depends on how quickly and accurately you react. Very intense — Fantastic Graphics, animation and control elements. (Disk) List $39.95. **Sale $18.95.**

**Summer Games II** — The original Summer Games was last Summer's No. 1 seller. Carry on the tradition with another chance to "Go for the Gold!" Introducing Summer Games II with 8 new Olympic events including Kayaking, cycling, fencing, diving, track & field, gymnastics and equastrian. The excitement of Olympic competion is present in this new version as it was in the original. Great graphics and sound effects. This one's a winner! (1 to 8 players). (Disk)
List $39.95. **Sale $20.95.**

**Movie Monster** — Remember all those Saturday afternoons in front of the TV, with a big bowl of popcorn and an old Japanese monster movie? If you do then Epyx has created a program that will soon become a favorite in your software library. You choose the monster and control the outcome of the movie. The movies of the past always ended with the destruction of the monster but you can turn the tables by placing your creation in the hero role. Develop exciting plots for hours of fun. (Disk) List $39.95. **Sale $23.95.**

**The New World's Greatest Baseball Game** — One of the season's hottest offerings is this new enhanced baseball program. Fans can take over managing their favorite team, or create an All-Star team with players from the past or present. Two double sided disks are filled with teams, players and their stats. The graphics are improved and the team roster is the most complete that is currently available. A scoreboard will challenge your knowledge of baseball trivia. Two game modes allow you to play and manage or just manage. Fantastic. (Disk) List $34.95. **Sale $18.95.**

**Super Graphics**

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6¼% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only


Reader Service No. 116

Commodore 64 SALE **Weekly Reader** Commodore 64 SALE

## ☆ ☆ *Educational Programs* ☆ ☆

**Stickybear Typing** — Stickybear makes learning the keyboard both easy & fun for anyone. A 3 game format provides different levels so that as typing skills improve so does the level of difficulty. ***Stickybear Keypress*** is geared to the needs of the child or the beginner, the stress is on the keyboard. To increase typing speed and accuracy the fast-paced ***Stickybear Thump*** will provide a real challenge. ***Stickybear Stories*** allows further practice with real text for timed practice. Everything from jokes, stories and bright amusing graphics make this one of the most delightful typing programs ever, plus you can keep track of your progress and store on disk. (Disk) List $29.95. **Sale $14.95.**




C64 SALE




C64 SALE




**Stickybear Spellgrabber** — 3 games in one: Picture Spell contains over 200 word/picture combinations. Word Spell is a scramble game, players recreate words shown on the screen. Bear Dunk involves guessing a word to save Stickybear from a dunking. (Disk) List $29.95. **Sale $14.95.**

**Stickybear Math** — Kids learn math skills as they help the Stickybear Family out of sticky jams. For every set of addition and subtraction problems youngsters get right, Stickybear gets a step closer to getting out of the jam. (Disk) List $29.95. **Sale $14.95.**

**Stickybear Town Builder**
Kids develop essential map skills as they build a town with roads, parks, airports, bridges, etc. and save on disk. That's just the first game. In Take A Drive, Compass-reading and directions are stressed. With Find The Keys, follow clues to locate mystery keys. (Disk)
List $29.95. **Sale $14.95.**



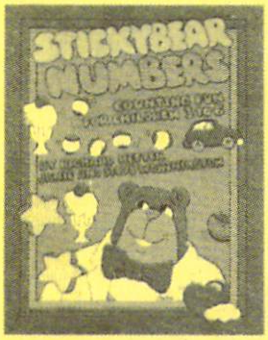




**Stickybear Reading**
3 fun activities that build reading comprehension skills. Match The Words: Kids practice vocabulary as they match up word and picture sets. Find The Word: Turns the words in a sentence into animated action. Build A Sentence: Children choose a subject, a verb and an object, then watch them turn into a picture. (Disk)
List $29.95. **Sale $14.95.**

**Stickybear ABC** — Beautifully animated pictures help children learn their ABC's and become familiar with computers. Two full-screen, full-color pictures with sound represent each letter in the alphabet. Besides helping boys and girls become familiar with computers, Stickybear ABC teaches younger children to recognize and name the letters. Older children begin to recognize words on sight. (Disk)
List $34.95. **Sale $14.95.**




**Stickybear Numbers** — There are colorful groups of big moving objects, such as ducks, birds and bears, that reinforce numbers and counting skills. You can use the space bar to learn to count up and down. The many possible picture combinations work to captivate youngsters with an endless variety of picture shows and give them plenty of hands on computer experience. (32 page book, disk, colorful Stickybear poster, Stickybear stickers.) (Disk) List $34.95. **Sale $14.95.**

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

**PROTECTO**
*We Love Our Customers*
22292 N. Pepper Rd., Barrington, Illinois 60010
**312/382-5244 to order**

Reader Service No. 116

HI-TECH EXPRESSIONS™




# Celebrate Every Occasion With Your Computer!

## You've no idea just how much fun your computer can be! With Hi Tech Expressions creative software, your computer will come alive with musical animation, paper printouts, and computer greetings.

With CardWare and HeartWare you can personalize the animation to make your own greeting disks. Or express special wishes on full-page printouts and folded cards.

Throw a high-tech party with PartyWare. Create festive invitations, banners, hats, games . . . all kinds of party stuff. You can even make floppy disk invitations!

And the data base will make sure that no occasion or friend is forgotten.

Add an artistic flair to all of your Hi Tech Expressions with WareWithAll. It's the state-of-the-art supply kit with everything you need to jazz up your computer creations.

Your computer never had such fun!

## CardWare™

**Animated Birthday Greeting Disk And All-Occasion Card Maker**
$7.95

## PartyWare™

**Card And Party Design Kit With Database Of Friends And Events**
$12.95

Available for Commodore 64/128. Atari 400, 800, 800 XL, 1200 XL, 130 XE, Apple IIe, c, + with 64K, and IBM PC, XT, AT and PC jr. with 256K and a color graphics adapter.

*Software not included in WareWithAll.

## Special For The Holidays

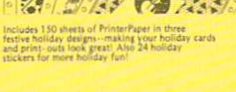
JingleDisk
Holiday Card-Maker and Greeting Disk
$4.95



New and improved for 1986! Makes more cards. This card maker prints all kinds of holiday cards! Great selection of graphics!

What's more you'll see an animated musical story set to traditional Yuletide carols for a unique computer greeting!

Holiday PrinterPaper
Festive Designs to Brighten All Your Season's Greetings
$7.95



Includes 150 sheets of PrinterPaper in three festive holiday designs--making your holiday cards and print-outs look great! Also 24 holiday stickers for more holiday fun!

Our Holiday Gift To You--FREE HOLIDAY GRAPHICS DISK!
When you redeem the enclosed coupon you'll receive a special selection of *Holiday Graphics* to use with PartyWare. PartyWare is a print utility for making Greeting Cards, Banners, Ornaments and all kinds of party stuff to celebrate the holidays through the New Year!

Reader Service No. 116

## HeartWare™

**Animated Friendship Greeting Disk And Love Note Maker**
$7.95

## WareWithAll™

**Colorfully Designed Paper, Envelopes, Stickers, Markers, Disk Labels, Disk***
$12.95

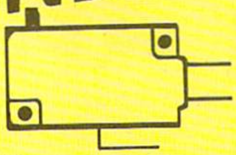
**Hi Tech Expressions, Inc.**
2699 South Bayshore Drive
Suite 1000A, Coconut Grove, Florida 33133
305/854-2318 1-800-848-9273
Telex 6712408 IMICO

# JOYSTICK SALE

## Arcade Quality Joysticks

### for Atari® /Commodore®

**NEW**



Microswitches

5 Year Warranty

Rated No. 1

*competition PRO™* **5000**

List $24.95

**Sale $16.95**



### for Atari® 5200

*competition PRO™* **5000**

List $29.95

**Sale $24.95**

Allows Keypad Hook Up

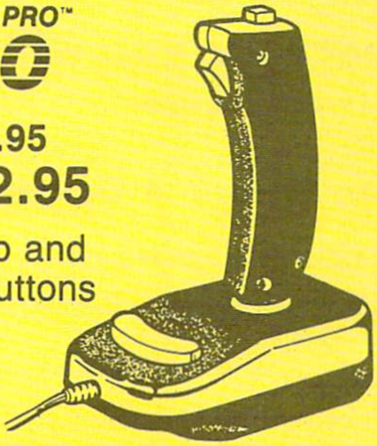
### Flight Control Joystick for Atari® /Commodore®

*competition PRO™* **3000**

List $19.95

**Sale $12.95**

Trigger, Top and Base Fire Buttons



### Economy Joystick for Atari® /Commodore®

*competition PRO™* **1000**



List $12.95

**Sale $4.95**

Single Fire Button

Spring Switches

### All these quality *competition PRO™* Joysticks feature:

- 2 or 5 year unconditional warranty
- Right or left hand operation
- Quality construction - Made in U.S.A.

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Add $3.00 for shipping, handling, and insurance. Illinois residents please add 6½% sales tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice.

**VISA — MASTER CARD — C.O.D.** C.O.D. on phone orders only.

Reader Service No. 116

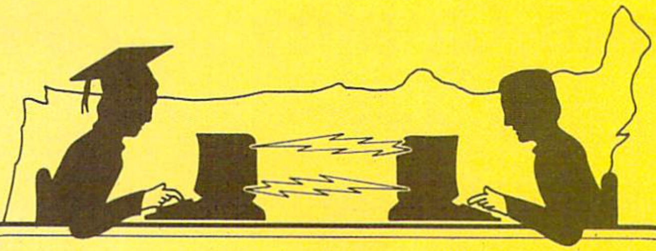
Commodore 64

# MODEM

Commodore 64

Sale

SAVE



List $99.00

**Sale**

**$29.95**

*Coupon $24.95*

List $99.00

**Sale**

**$29.95**

*Coupon $24.95*

**Telecommunications**

***Lowest Price In the U.S.A.***

**FOR CHILDREN·ADULTS·BUSINESS**

# Complete Auto Dial Telecommunications Package

***"The only telecommunications package you will ever need."***

**(Exclusive Easy To Use Features)**

- **300 Baud Modem** • **Auto Dial** • **Auto Answer** • **Upload & Download**

## Reach Out and Access Someone

- Educational courses
- Financial Information
- Banking at Home
- Popular Games
- News Updates and Information
- Electronic Shopping
- Research and Reference Materials

**The Complete Telecommunications Package offers you all this plus ...**

- Auto Log-on
- Dialing from Keyboard
- On-line Clock
- Capture and Display High Resolution Characters
- Download Text, Program or Data Files
- Stores on Disk Downloaded Files
- Reads Files from Disk and Uploads Text or Program Files
- Select Any Protocol (access almost any computer or modem)
- Plus Much, Much More

List $99.00 **Sale $29.95** *Coupon $24.95*

**We are so sure this is the only telecommunications package you will need we will give you 15 days Free Trial.**

Add $3.00 for shipping, handling and insurance. Illinois residents please add 6½% tax. Add $6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! Prices & availability subject to change without notice.
VISA — MASTER CARD — C.O.D. C.O.D. on Phone orders only

**PROTECTO**

*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5244 to order**

Reader Service No. 116

# Complete Apple® Compatible Word Processing System

## Home • Business • Word Processing




## Look At All You Get For Only $499.00

| | List Price |
|---|---|
| • Laser 128 Apple Compatible Computer | $499.00 |
| • Big Blue 8½" Letter Size 80 Column Printer | 199.00 |
| • 9" Samsung Green Screen Monitor | 129.95 |
| • Magic Window IIe Word Processor | 150.00 |
| • Magicalc Spreadsheet | 150.00 |
| • Magic Memory Data Base | 60.00 |
| • Laser 128 Printer Interface | 19.95 |
| • 2 Rolls of Paper | 19.95 |
| Comparable Apple System ($2495.00) | 1227.85 |

**Save Over $700.00**

**All 8 Pieces only $499.00**

**Magic Window IIe** Word processing is easy and more efficient because of a simple-to-read menu system and editing commands. Many powerful features of professional quality programs and more. Supports virtually all major printer functions. Operates with most 80-column video cards or 40/70 column no-hardware modes.

**Magicalc** Rated as the best electronic spreadsheet on the market for Apple®. The speed with which Magicalc solves number problems allows you to accurately analyze decisions beforehand. Supports multiple RAM cards of most manufacturers in any combinations up to a full 512 K.

**Magic Memory** File anything, any way you want to: names, addresses, important numbers, dates and notes. Your information is organized simply, easy to maintain, and available instantly. Supports all popular printers and video cards.

Apple® is a registered trademark of Apple Computer Inc.

Add $30.00 for shipping, handling, and insurance. Illinois residents please add 6½% sales tax. Add $60.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice.

**VISA — MASTER CARD — C.O.D.** C.O.D. on phone orders only.

# Computer Direct

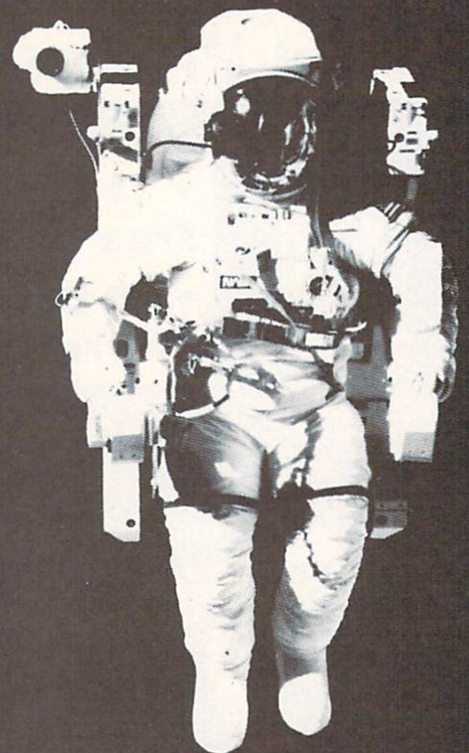
*We Love Our Customers*

22292 N. Pepper Rd., Barrington, Illinois 60010

**312/382-5050 to order**

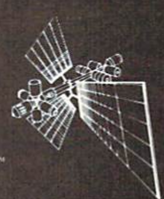
Reader Service No. 116

# TRY THIS ON FOR SIZE.



At the United States Space Camp, you'll have to. It's required attire, you see, in your training for a Space Shuttle mission. You'll be piloting a shuttle simulator, working under weightless conditions, doing what most people only see on the six o'clock news.

PROJECT: SPACE STATION™



Our space station construction software, can get you to Space Camp for the time of your life. You'll need to get your hands on it and build us your best station.

We'd like to see you in this suit. Soon. See your favorite software dealer for a Space Camp Scholarship booklet and construction guidelines, or write to us at the address below.

HesWare

P.O. Box 631-SCS
So. San Francisco, CA 94080
(415) 871-0570

Reader Service No. 202


# FLOTSAM

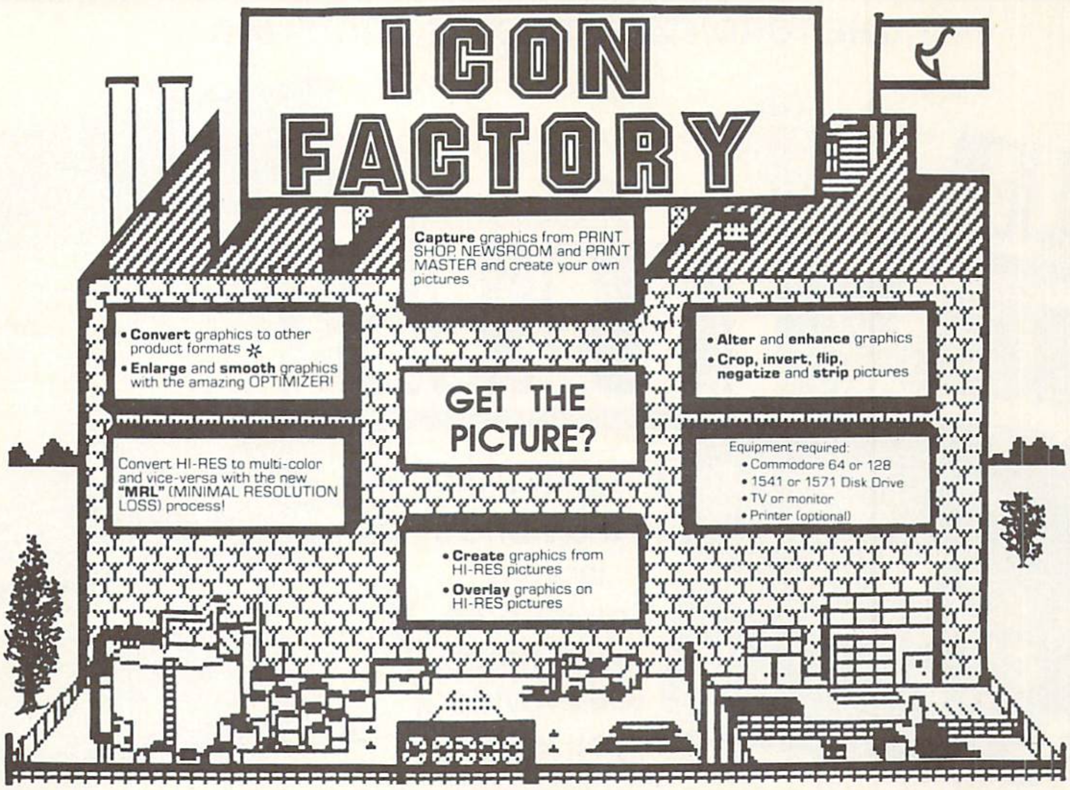
I just received GEOS in the mail and immediately consumed the reference manual. With preliminaries out of the way, I sat down to experience my new world. My fun soon turned to despair as the backup utility failed to copy onto a brand new disk. With a little testing, I determined a misaligned disk drive was the culprit. Oh brother. I considered ordering a disk alignment program through the mail, but that takes time and my new program would lie dormant. I was not about to invite tragedy by working with the original disk. But somewhere in the back of my mind, I remembered such a utility being published in a magazine. After a frantic search through all of my back issues with no luck, I finally dug up a magazine I had been entering a program from and had not yet checked. *Ahoy!* issue 26–Feb. '86–on page 83. *Yes!* That's where it was! For two hours I performed surgery with the tools and instructions I found there. The patient not only survived, but is doing great! And best of all, I got to dive head first into GEOS that night! So all I really wrote to say is THANK YOU!! for such a useful article.

–Thomas P. Shultz
Clarion, PA

I am not a subscriber to your magazine, but I do pick it up at the newsstand fairly regularly. It's reasonably well done and the price makes it stand out. Though in general I approve of what you do, I take offense at an ad which appeared in the June 1986 issue on page 55. It's for a C-64 program called *The Attractor.* This kind of sexist sleaze has no business in this magazine. Perhaps Bob Guccione would run it, but a mature computer magazine should not. The ad appears to be aimed at 14 year old boys and at lonely, desperate computer jocks. It is degrading to both women and computer professionals. Be it known that there is at least one computer professional who reads this magazine who is above the age of 14 and who has a perfectly healthy social life. I suspect that I'm not alone. It might be interesting to poll your readers as to age group and profession to see if such an ad really reaches its intended audience.

I think it might behoove your editorial staff to take a closer look at what is getting printed. I dislike the thought of anyone playing censor, but on the other hand, this kind of sleazeware gives the software industry a bad name. The "programmers" who write this kind of pseudo-psychological crap and the marketing people who foist it off on us don't deserve a second look, let alone a full page ad. *New Yorker* would likely not print an ad for those "How to get a girl" books and *Science Digest* would not run an ad for spanish fly, so why should you feel obligated to run this sort of ad? If you need to increase revenue, try raising your price by a dime or so. Surely quality is worth that.

–Gary R. Heffelfinger
Greenville, SC




# Photo Finish

— *now available,*

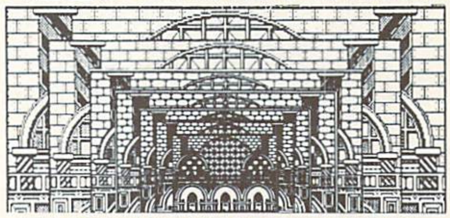
With our **NEW** product, you can get an **"OPTIMIZED PRINT DUMP"**

Take pictures or graphics from the most popular graphic utilities* for the Commodore 64/128 computers and print them quickly and easily for a truly

**SMO-O-OTH LOOK!**

- View and adjust gray scale patterns **ON YOUR SCREEN** to shade your image for a perfect "photo finish".
- Horizontal or vertical output with optional "optimized" print.
- Supports Commodore, Okidata, Epson and compatible printers as well as a user defined printer option.

# BILLBOARDMAKER*



**IMAGINE TAKING YOUR USUAL 8½ inch by 6½ inch output AND ENLARGING IT TO 4 FEET BY 3 FEET !!!!**

*** * * SIMPLY INCREDIBLE * * ***

Features:

- **DUMP** shaded standard and ENLARGED graphic pictures to your printer QUICKLY and EASILY
- **TYPESETTER** - overlay specially designed TEXT fonts and ICONS On your picture - A TRUE SIGN MAKER
- **INCREDIBLE RESOLUTION** - allows re-drawing of detail to enlarged sections
- **CONTROL BOARD** - bring your own pictures into your own programs easily
- **CONVERT** picture file formats to other product formats
- **SMOOTH** those ragged lines with the amazing "Optimizer"
- **FLIP** pictures for iron-on applications
- **STRIP** color from your picture
- **REVERSE** picture to negative - CROP and FRAME pictures

AND MANY MORE GREAT FEATURES
PROFESSIONAL RESULTS - EASY and FUN to USE

ALL AVAILABLE FROM: solutions unlimited

P.O. Box 177
Dobbs Ferry, New York 10522-0177
(914) 693-3496

✲ ANIMATION STATION © Suncom, COMPUTEREYES © Digital Vision, FLEXIDRAW © Inkwell, PRINT SHOP © Broderbund Software, BLAZING PADDLES © Baudville, DOODLE © Omni, KOALA © Koala Technologies Corp, SUPERSKETCH © Personal Peripherals, COMMODORE 64/128 © Commodore Business Machines, NEWSROOM © Springboard Software, PRINT MASTER © Unison World, ICON FACTORY © 1986 Solutions Unlimited, BILLBOARD MAKER © Solutions Unlimited

✱ (BILLBOARD MAKER works with all of the above except NEWSROOM and PRINT MASTER and only with "Screen Magic" section of PRINT SHOP)

Reader Service No. 178

## THE TORONTO PET USERS GROUP INC.




# TPUG

**A membership in the world's largest Commodore users' group will provide you with:**

- 10 issues of TPUG magazine
- Advice from experts like Jim Butterfield and Elizabeth Deal
- Access to a huge library of outstanding public domain software
- An invitation to attend the Annual TPUG conference, May 25 and 26 in Toronto, Canada, with two full days of seminars on all aspects of Commodore computing.

# JOIN NOW!

I would like to join TPUG as an associate member at a cost of US$25.00.

Send your cheque, money order or credit card number to:

**TPUG Inc.**
**101 Duncan Mill Road, Suite G7**
**Don Mills, Ontario, Canada**
**M3B 1Z3**

Name ______________________________

Address ______________________________

______________________________

☐ Cheque ☐ Money Order ☐ Credit Card ________ Amount in U.S. funds $ ________

Credit Card # ________ Expiry date ________ Signature ________

Type of Computer ________ Disk Drive ________ Printer ________ Modem ________ Other ________

# PROGRAM LISTINGS

**Attention new *Ahoy!* readers! You must read the following information very carefully prior to typing in programs listed in *Ahoy!* Certain Commodore characters, commands, and strings of characters and commands will appear in a special format. Follow the instructions and listing guide on this page.**

On the following pages you'll find several programs that you can enter on your Commodore computer. But before doing so, read this entire page carefully.

To insure clear reproductions, *Ahoy!*'s program listings are generated on a daisy wheel printer, incapable of printing the commands and graphic characters used in Commodore programs. These are therefore represented by various codes enclosed in brackets [ ]. For example: the SHIFT CLR/HOME command is represented onscreen by a heart . The code we use in our listings is [CLEAR]. The chart below lists all such codes which you'll encounter in our listings, except for one other special case.

The other special case is the COMMODORE and SHIFT characters. On the front of most keys are two symbols. The symbol on the left is obtained by pressing that key while holding down the COMMODORE key; the symbol on the right, by pressing that key while holding down the SHIFT key. COMMODORE and SHIFT characters are represented in our listings by a lower-case "s" or "c" followed by the symbol of the key you must hit. COMMODORE J, for example, is represented by [c J], and SHIFT J by [s J].

Additionally, any character that occurs more than two times in a row will be displayed by a coded listing. For example, [3 "[LEFT]"] would be 3 CuRSoR left commands in a row, [5 "[s EP]"] would be 5 SHIFTed English Pounds, and so on. Multiple blank spaces will be noted in similar fashion: e.g., 22 spaces as [22 " "].

Sometimes you'll find a program line that's too long for the computer to accept (C-64 lines are a maximum of 80 characters, or 2 screen lines long; VIC 20 lines, a maximum of 88 characters, or 4 screen lines). To enter these lines, refer to the *BASIC Command Abbreviations Appendix* in your User Manual.

On the next page you'll find our *Bug Repellent* programs for the C-128 and C-64. The version appropriate for your machine will help you proofread our programs after you type them. (Please note: the *Bug Repellent* line codes that follow each program line, in the whited-out area, should *not* be typed in. See the instructions preceding each program.)

Also on the following page you will find *Flankspeed*, our ML entry program, and instructions on its use. □

**Call *Ahoy!* at 212-239-0855 with any problems.**

| When You See | It Means | You Type | You Will See |
|---|---|---|---|
| [CLEAR] | Screen Clear | SHIFT CLR/HOME | |
| [HOME] | Home | CLR/HOME | |
| [UP] | Cursor Up | SHIFT ↑CRSR↓ | |
| [DOWN] | Cursor Down | ↑CRSR↓ | |
| [LEFT] | Cursor Left | SHIFT ←CRSR→ | |
| [RIGHT] | Cursor Right | ←CRSR→ | |
| [SS] | Shifted Space | SHIFT Space | |
| [INSERT] | Insert | SHIFT INST/DEL | |
| [DEL] | Delete | INST/DEL | |
| [RVSON] | Reverse On | CNTRL 9 | |
| [RVSOFF] | Reverse Off | CNTRL 0 | |
| [UPARROW] | Up Arrow | ↑ | |
| [BACKARROW] | Back Arrow | ← | |
| [PI] | PI | π | |
| [EP] | English Pound | £ | |

| When You See | If Means | You Type | You Will See |
|---|---|---|---|
| [BLACK] | Black | CNTRL 1 | |
| [WHITE] | White | CNTRL 2 | |
| [RED] | Red | CNTRL 3 | |
| [CYAN] | Cyan | CNTRL 4 | |
| [PURPLE] | Purple | CNTRL 5 | |
| [GREEN] | Green | CNTRL 6 | |
| [BLUE] | Blue | CNTRL 7 | |
| [YELLOW] | Yellow | CNTRL 8 | |
| [F1] | Function 1 | F1 | |
| [F2] | Function 2 | SHIFT F1 | |
| [F3] | Function 3 | F3 | |
| [F4] | Function 4 | SHIFT F3 | |
| [F5] | Function 5 | F5 | |
| [F6] | Function 6 | SHIFT F5 | |
| [F7] | Function 7 | F7 | |
| [F8] | Function 8 | SHIFT F7 | |

## BUG REPELLENT By MICHAEL KLEINERT and DAVID BARRON

*Bug Repellent* is a checksum program used for proofreading BASIC listings typed in from *Ahoy!* magazine. For each program line you enter, *Bug Repellent* will produce a two-letter code that should match the code listed beside that line in the magazine.

Type in, save, and run the *Bug Repellent.* (If you have a C-64, type in the C-64 version. If you have a C-128, you will need to type in the C-64 version for use with C-64 programs, and the C-128 version for use with C-128 programs.) If you have typed in *Bug Repellent* properly, you will get the message BUG REPELLENT INSTALLED; otherwise you will get an error message. If you get an error message, double check the *Bug Repellent* program for typing mistakes. Type NEW and hit RETURN. Then type in and save, or load, the *Ahoy!* program you wish to check. Type in SYS 49152 for the C-64 version or SYS 3072 for the C-128 version and hit RETURN (this will begin execution of *Bug Repellent*). You will see the prompt SCREEN OR PRINTER ? Hit S if you want the codes listed on the screen, or P if you want them listed on the printer. To pause the listing depress and hold the SHIFT key.

Compare the codes your machine generates to those listed to the right of the corresponding program lines. If you spot a difference, that line contains an error. Write down the numbers of the lines where the contradictions occur. LIST each line, locate the errors, and correct them.

### COMMODORE 64 VERSION

```
·100 FOR X = 49152 TO 49488:READY:S=S+Y              AB
·110 IF Y<0 OR Y>255 THEN 130                        EA
·120 POKE X,Y:NEXT:GOTO140                           ID
·130 PRINT"[CLEAR][DOWN]**ERROR**":PRINT"[DOWN
 ]PLEASE CHECK LINE"PEEK(64)*256+PEEK(63):END        ID
·140 IF S<>44677 THEN PRINT"[CLEAR][DOWN]**ERR
 OR**":PRINT"[DOWN]PLEASE CHECK DATA LINES 170
 -500":END                                           HJ
·150 PRINT"[CLEAR]":POKE53280,0:POKE53281,6:PO
 KE646,1                                             NP
·160 PRINT"[RVSON][6" "]C-64 BUG REPELLENT INS
 TALLED[6" "]"                                       LF
·170 DATA32,161,192,165,43,133,251,165,44,133        DL
·180 DATA252,160,0,132,254,32,37,193,234,177         DB
·190 DATA251,208,3,76,138,192,230,251,208,2          OF
·200 DATA230,252,76,43,192,76,73,78,69,32            KN
·210 DATA35,32,0,169,35,160,192,32,30,171            CA
·220 DATA160,0,177,251,170,230,251,208,2,230         CE
·230 DATA252,177,251,32,205,189,169,58,32,210        JE
·240 DATA255,169,0,133,253,230,254,32,37,193         CL
·250 DATA234,165,253,160,0,76,13,193,133,253         NB
·260 DATA177,251,208,237,165,253,41,240,74,74        MB
·270 DATA74,74,24,105,65,32,210,255,165,253          EP
·280 DATA 41,15,24,105,65,32,210,255,169,13          GH
·290 DATA32,220,192,230,63,208,2,230,64,230          AN
·300 DATA251,208,2,230,252,76,11,192,169,153         NG
·310 DATA160,192,32,30,171,166,63,165,64,76          BF
·320 DATA231,192,96,76,73,78,69,83,58,32             EP
·330 DATA0,169,247,160,192,32,30,171,169,3           PJ
·340 DATA133,254,32,228,255,201,83,240,6,201         FK
·350 DATA80,208,245,230,254,32,210,255,169,4         FL
·360 DATA166,254,160,255,32,186,255,169,0,133        CL
·370 DATA63,133,64,133,2,32,189,255,32,192           GC
·380 DATA255,166,254,32,201,255,76,73,193,96         NN
·390 DATA32,210,255,173,141,2,41,1,208,249           NH
·400 DATA96,32,205,189,169,13,32,210,255,32          IM
·410 DATA204,255,169,4,76,195,255,147,83,67          KC
·420 DATA82,69,69,78,32,79,82,32,80,82               DC
·430 DATA 73,78,84,69,82,32,63,32,0,76               ML
·440 DATA44,193,234,177,251,201,32,240,6,138         GN
·450 DATA113,251,69,254,170,138,76,88,192,0          JK
·460 DATA0,0,0,230,251,208,2,230,252,96              NA
·470 DATA170,177,251,201,34,208,6,165,2,73           DM
·480 DATA255,133,2,165,2,208,218,177,251,201         JA
·490 DATA32,208,212,198,254,76,29,193,0,169          FM
·500 DATA13,76,210,255,0,0,0                         PA
```

### COMMODORE 128 VERSION

```
·100 FAST:FOR X = 3072 TO 3520:READ Y:POKE X,Y
 :S=S+Y:TRAP110:NEXT:SLOW                            IH
·110 SLOW:IF S<>49057 THEN PRINT"[CLEAR][DOWN]
 **ERROR**":PRINT"[DOWN]PLEASE CHECK DATA LINE
 S 140-390":END                                      JA
·120 PRINT"[CLEAR][DOWN]  C-128 BUG REPELLENT
 INSTALLED"                                          II
·130 PRINT"[4" "]TYPE SYS 3072 TO ACTIVATE"          IN
·140 DATA 32,161,12,165,45,133,251,165,46,133,
 252,160,0,132,254,32,37                             OF
·150 DATA 13,234,177,251,208,3,76,138,12,230,2
 51,208,2,230,252,76,43                              NC
·160 DATA 12,76,73,78,69,32,35,32,0,169,35,160
 ,12,32,80,13,160,0,177                              OL
·170 DATA 251,170,230,251,208,2,230,252,177,25
 1,32,89,13,169,58,32,98                             EF
·180 DATA 13,169,0,133,253,230,254,32,37,13,23
 4,165,253,160,0,76,13                               JO
·190 DATA 13,133,253,177,251,208,237,165,253,4
 1,240,74,74,74,74,24                                LC
·200 DATA 105,65,32,98,13,165,253,41,15,24,105
 ,65,32,98,13,169,13,32                              DE
·210 DATA 220,12,230,65,208,2,230,66,230,251,2
 08,2,230,252,76,11,12                               GM
·220 DATA 169,153,160,12,32,80,13,166,65,165,6
 6,76,231,12,96,76,73,78                             CP
·230 DATA 69,83,58,32,0,169,247,160,12,32,80,1
 3,169,3,133,254,32,107                              HC
·240 DATA 13,201,83,240,6,201,80,208,245,230,2
 54,32,98,13,169,4,166                               GK
·250 DATA 254,160,255,32,116,13,169,0,133,65,1
 33,66,133,250,32,125,13                             LB
·260 DATA 32,134,13,166,254,32,143,13,76,73,13
 ,96,32,98,13,165,211                                JF
·270 DATA 234,41,1,208,249,96,32,89,13,169,13,
 32,98,13,32,152,13,169,4                            GD
·280 DATA 76,161,13,147,83,67,82,69,69,78,32,7
 9,82,32,80,82,73,78,84,69                           PL
·290 DATA 82,32,63,32,0,76,44,13,234,177,251,2
 01,32,240,6,138,113,251,69                          OK
·300 DATA 254,170,138,76,88,12,0,0,0,0,230,251
 ,208,2,230,252,96,170,177                           FJ
·310 DATA 251,201,34,208,6,165,250,73,255,133,
 250,165,250,208,218,177                             GA
·320 DATA 251,201,32,208,212,198,254,76,29,13,
 0,169,13,76,98,13,0,0,32                            FI
·330 DATA 170,13,32,226,85,76,180,13,32,170,13
 ,32,50,142,76,180,13,32                             OF
·340 DATA 170,13,32,210,255,76,180,13,32,170,1
 3,32,228,255,76,180,13,32                           AK
·350 DATA 170,13,32,186,255,76,180,13,32,170,1
 3,32,189,255                                        BP
·360 DATA 76,180,13,32,170,13,32,192,255,76,18
 0,13,32,170,13                                      FP
·370 DATA 32,201,255,76,180,13,32,170,13,32,20
 4,255,76,180,13,32,170                              ID
·380 DATA 13,32,195,255,76,180,13,133,67,169,0
 ,141,0,255,165,67,96                                BJ
·390 DATA 133,67,169,0,141,1,255,165,67,96,0,0
 ,0                                                  IF
```

# FLANKSPEED FOR THE C-64 By GORDON F. WHEAT

*Flankspeed* will allow you to enter machine language *Ahoy!* programs without any mistakes. Once you have typed the program in, save it for future use. While entering an ML program with *Flankspeed* there is no need to enter spaces or hit the carriage return. This is all done automatically. If you make an error in a line a bell will ring and you will be asked to enter it again. To LOAD in a program Saved with *Flankspeed* use LOAD "name",1,1 for tape, or LOAD "name",8,1 for disk. The function keys may be used after the starting and ending addresses have been entered.

f1 – SAVEs what you have entered so far.

f3 – LOADs in a program worked on previously.

f5 – To continue on a line you stopped on after LOADing in the previous saved work.

f7 – Scans through the program to locate a particular line, or to find out where you stopped the last time you entered the program. f7 temporarily freezes the output as well.

```
·100 POKE53280,12:POKE53281,11                                    LL
·105 PRINT"[CLEAR][c 8][RVSON][15" "]FLANKSPEED[15" "]";           ED
·110 PRINT"[RVSON][5" "]MISTAKEPROOF ML ENTRY PROGRAM[6" "
 ]"                                                               MC
·115 PRINT"[RVSON][9" "]CREATED BY G. F. WHEAT[9" "]"              DM
·120 PRINT"[RVSON][3" "]COPR. 1984, ION INTERNATIONAL INC.
 [3" "]"                                                          DH
·125 FORA=54272TO54296:POKEA,0:NEXT                                IM
·130 POKE54272,4:POKE54273,48:POKE54277,0:POKE54278,249:PO
 KE54296,15                                                       NH
·135 FORA=680TO699:READB:POKEA,B:NEXT                              KO
·140 DATA169,251,166,253,164,254,32,216,255,96                     HJ
·145 DATA169,0,166,251,164,252,32,213,255,96                       JB
·150 B$="STARTING ADDRESS IN HEX":GOSUB430:AD=B:SR=B               KA
·155 GOSUB480:IFB=0THEN150                                         GN
·160 POKE251,T(4)+T(3)*16:POKE252,T(2)+T(1)*16                     KE
·165 B$="ENDING ADDRESS IN HEX":GOSUB430:EN=B                      LO
·170 GOSUB470:IFB=0THEN150                                         EE
·175 POKE254,T(2)+T(1)*16:B=T(4)+1+T(3)*16                         MN
·180 IFB>255THENB=B-255:POKE254,PEEK(254)+1                        GE
·185 POKE253,B:PRINT                                               HN
·190 REM  GET HEX LINE                                             IL
·195 GOSUB495:PRINT": [c P][LEFT]";:FORA=0TO8                      NH
·200 FORB=0TO1:GOTO250                                             MP
·205 NEXTB                                                         ME
·210 A%(A)=T(1)+T(0)*16:IFAD+A-1=ENTHEN340                         LE
·215 PRINT" [c P][LEFT]";                                          IK
·220 NEXTA:T=AD-(INT(AD/256)*256):PRINT" "                         PD
·225 FORA=0TO7:T=T+A%(A):IFT>255THENT=T-255                        LK
·230 NEXT                                                          IA
·235 IFA%(8)<>TTHENGOSUB375:GOTO195                                LE
·240 FORA=0TO7:POKEAD+A,A%(A):NEXT:AD=AD+8:GOTO195                 BI
·245 REM    GET HEX INPUT                                          AB
·250 GETA$:IFA$=""THEN250                                          HK
·255 IFA$=CHR$(20)THEN305                                          HF
·260 IFA$=CHR$(133)THEN535                                         KH
·265 IFA$=CHR$(134)THEN560                                         JM
·270 IFA$=CHR$(135)THENPRINT" ":GOTO620                            EG
·275 IFA$=CHR$(136)THENPRINT" ":GOTO635                            AB
·280 IFA$>"@"ANDA$<"G"THENT(B)=ASC(A$)-55:GOTO295                  DL
·285 IFA$>"/"ANDA$<":"THENT(B)=ASC(A$)-48:GOTO295                  MD
·290 GOSUB415:GOTO250                                              JJ
·295 PRINTA$"[c P][LEFT]";                                         OA
·300 GOTO205                                                       CF
·305 IFA>0THEN320                                                  PG
·310 A=-1:IFB=1THEN330                                             OI
·315 GOTO220                                                       BM
·320 IFB=0THENPRINTCHR$(20);CHR$(20);:A=A-1                        HG
·325 A=A-1                                                         BE
·330 PRINTCHR$(20);:GOTO220                                        LK
·335 REM LAST LINE                                                 AD
·340 PRINT" ":T=AD-(INT(AD/256)*256)                               GJ
·345 FORB=0TOA-1:T=T+A%(B):IFT>255THENT=T-255                      PL
·350 NEXT                                                          IA
·355 IFA%(A)<>TTHENGOSUB375:GOTO195                                NF
·360 FORB=0TOA-1:POKEAD+B,A%(B):NEXT                               HN
·365 PRINT:PRINT"YOU ARE FINISHED!":GOTO535                        JA
·370 REM BELL AND ERROR MESSAGES                                   FL
·375 PRINT:PRINT"LINE ENTERED INCORRECTLY":PRINT:GOTO415           DA
·380 PRINT:PRINT"INPUT A 4 DIGIT HEX VALUE!":GOTO415               FF
·385 PRINT:PRINT"ENDING IS LESS THAN STARTING!":B=0:GOTO41
 5                                                                HD
·390 PRINT:PRINT"ADDRESS NOT WITHIN SPECIFIED RANGE!":B=0:
 GOTO415                                                          OK
·395 PRINT:PRINT"NOT ZERO PAGE OR ROM!":B=0:GOTO415                FN
·400 PRINT"?ERROR IN SAVE":GOTO415                                 PP
·405 PRINT"?ERROR IN LOAD":GOTO415                                 PO
·410 PRINT:PRINT:PRINT"END OF ML AREA":PRINT                       PG
·415 POKE54276,17:POKE54276,16:RETURN                              BH
·420 OPEN15,8,15:INPUT#15,A,A$:CLOSE15:PRINTA$:RETURN              IM
·425 REM GET FOUR DIGIT HEX                                        PC
·430 PRINT:PRINTB$;:INPUTT$                                        GM
·435 IFLEN(T$)<>4THENGOSUB380:GOTO430                              NP
·440 FORA=1TO4:A$=MID$(T$,A,1):GOSUB450:IFT(A)=16THENGOSUB
 380:GOTO430                                                      FJ
·445 NEXT:B=(T(1)*4096)+(T(2)*256)+(T(3)*16)+T(4):RETURN           GF
·450 IFA$>"@"ANDA$<"G"THENT(A)=ASC(A$)-55:RETURN                   EH
·455 IFA$>"/"ANDA$<":"THENT(A)=ASC(A$)-48:RETURN                   KP
·460 T(A)=16:RETURN                                                NP
·465 REM ADRESS CHECK                                              LI
·470 IFAD>ENTHEN385                                                LB
·475 IFB<SRORB>ENTHEN390                                           KC
·480 IFB<256OR(B>40960ANDB<49152)ORB>53247THEN395                  MG
·485 RETURN                                                        IM
·490 REM ADDRESS TO HEX                                            EB
·495 AC=AD:A=4096:GOSUB520                                         FD
·500 A=256:GOSUB520                                                PE
·505 A=16:GOSUB520                                                 MI
·510 A=1:GOSUB520                                                  IL
·515 RETURN                                                        IM
·520 T=INT(AC/A):IFT>9THENA$=CHR$(T+55):GOTO530                    PE
·525 A$=CHR$(T+48)                                                 JP
·530 PRINTA$;:AC=AC-A*T:RETURN                                     AC
·535 A$="**SAVE**":GOSUB585                                        LH
·540 OPEN1,T,1,A$:SYS680:CLOSE1                                    LH
·545 IFST=0THENEND                                                 EO
·550 GOSUB400:IFT=8THENGOSUB420                                    CM
·555 GOTO535                                                       CL
·560 A$="**LOAD**":GOSUB585                                        NE
·565 OPEN1,T,0,A$:SYS690:CLOSE1                                    MF
·570 IFST=64THEN195                                                LC
·575 GOSUB405:IFT=8THENGOSUB420                                    AN
·580 GOTO560                                                       CL
·585 PRINT" ":PRINTTAB(14)A$                                       FG
·590 PRINT:A$="":INPUT"FILENAME";A$                                OM
·595 IFA$=""THEN590                                                DD
·600 PRINT:PRINT"TAPE OR DISK?":PRINT                              DF
·605 GETB$:T=1:IFB$="D"THENT=8:A$="@0:"+A$:RETURN                  IG
·610 IFB$<>"T"THEN605                                              BO
·615 RETURN                                                        IM
·620 B$="CONTINUE FROM ADDRESS":GOSUB430:AD=B                      OH
·625 GOSUB475:IFB=0THEN620                                         GH
·630 PRINT:GOTO195                                                 PH
·635 B$="BEGIN SCAN AT ADDRESS":GOSUB430:AD=B                      FA
·640 GOSUB475:IFB=0THEN635                                         IB
·645 PRINT:GOTO670                                                 PP
·650 FORB=0TO7:AC=PEEK(AD+B):GOSUB505:IFAD+B=ENTHENAD=SR:G
 OSUB410:GOTO195                                                  NK
·655 PRINT" ";:NEXTB                                               EC
·660 PRINT:AD=AD+8                                                 GN
·665 GETB$:IFB$=CHR$(136)THEN195                                   LI
·670 GOSUB495:PRINT": ";:GOTO650                                   IB
```

# THE SHADOW KNOWS

## FROM PAGE 27

**Assembler required for entry! See introductory article.**

**SPRITE 1**

```
*
* SPRITE1
*
         ORG    $1300
*
COLOR    EQU    $E0
*
TABLEN   EQU    $800
MAPLEN   EQU    1000
SCRLEN   EQU    8000
SP0ADR   EQU    $4E00
COLMAP   EQU    $5C00
NEWADR   EQU    $4000
*
SPRPTR   EQU    $5FF8
SPENA    EQU    $D015
SP0COL   EQU    $D027
SP0X     EQU    $11D6
SP0Y     EQU    $11D7
MSIGX    EQU    $11E6
YXPAND   EQU    $D017
XXPAND   EQU    $D01D
*
INDFET   EQU    $FF74
*
HMAX     EQU    320
VMID     EQU    100-8
*
R6510    EQU    $0001
BASE     EQU    $6000
CHRBAS   EQU    $D000
SCROLY   EQU    $D011
SVMCSB   EQU    $A2D
BORDER   EQU    $D020
CIACRE   EQU    $DC0E
CI2PRA   EQU    $DD00
CIADIR   EQU    $DD02
*
TMPA     EQU    $C8
TMPB     EQU    TMPA+2
TPTR     EQU    TMPA
*
MSRC     EQU    $FA
MDST     EQU    MSRC+2
BPTR     EQU    MDST+2
*
TABSIZ   EQU    $0C00
*
HPSN     EQU    TABSIZ+2
VPSN     EQU    HPSN+2
CHAR     EQU    VPSN+1
ROW      EQU    CHAR+1
LINE     EQU    ROW+1
BYTE     EQU    LINE+1
BITT     EQU    BYTE+2
*
MPRL     EQU    BITT+1
MPRH     EQU    MPRL+1
MPDL     EQU    MPRH+1
MPDH     EQU    MPDL+1
PRODL    EQU    MPDH+1
PRODH    EQU    PRODL+1
FILVAL   EQU    PRODH+1
LENPTR   EQU    FILVAL+1
CHCODE   EQU    LENPTR+2
HPTR     EQU    CHCODE+2
VPTR     EQU    HPTR+2
ONEBYT   EQU    VPTR+1
COUNT    EQU    ONEBYT+2
LTTR     EQU    COUNT+1
*
         JMP    START
*
TEXT     DFB    9,32,32,13
         DFB    25,32,3,15
         DFB    13,13,15,4
         DFB    15,18,5,32
         DFB    49,50,56,0
*
* BLOCK FILL ROUTINE
*
BLKFIL   LDA    FILVAL
         LDX    TABSIZ+1
         BEQ    PARTPG
         LDY    #0
FULLPG   STA    (TPTR),Y
         INY
         BNE    FULLPG
         INC    TPTR+1
         DEX
         BNE    FULLPG
PARTPG   LDX    TABSIZ
         BEQ    FINI
         LDY    #0
PARTLP   STA    (TPTR),Y
         INY
         DEX
         BNE    PARTLP
FINI     RTS
*
* MULTIPLICATION ROUTINE
*
MULT16   LDA    #0
         STA    PRODL
         STA    PRODH
         LDX    #17
         CLC
MULT     ROR    PRODH
         ROR    PRODL
         ROR    MPRH
         ROR    MPRL
         BCC    CTDOWN
         CLC
         LDA    MPDL
         ADC    PRODL
         STA    PRODL
         LDA    MPDH
         ADC    PRODH
         STA    PRODH
CTDOWN   DEX
         BNE    MULT
         RTS
*
* PLOT ROUTINE
*
* ROW=VPSN/8
*
PLOT     LDA    VPSN
         LSR    A
         LSR    A
         LSR    A
         STA    ROW
*
* CHAR=HPSN/8
*
         LDA    HPSN
         STA    TMPA
         LDA    HPSN+1
         STA    TMPA+1
         LDX    #3
DLOOP    LSR    TMPA+1
         ROR    TMPA
         DEX
         BNE    DLOOP
         LDA    TMPA
         STA    CHAR
*
* LINE=VPSN AND 7
*
         LDA    VPSN
         AND    #7
         STA    LINE
*
* BITT=7-(HPSN AND 7)
*
         LDA    HPSN
         AND    #7
         STA    BITT
         SEC
         LDA    #7
         SBC    BITT
         STA    BITT
*
* BYTE=BASE+ROW*HMAX
*      +8*CHAR+LINE
* MULTIPLY ROW * HMAX
*
```

```
         LDA   ROW
         STA   MPRL
         LDA   #0
         STA   MPRH
         LDA   #<HMAX
         STA   MPDL
         LDA   #>HMAX
         STA   MPDH
         JSR   MULT16
         LDA   MPRL
         STA   TMPA
         LDA   MPRL+1
         STA   TMPA+1
*
* ADD PRODUCT TO BASE
*
         CLC
         LDA   #<BASE
         ADC   TMPA
         STA   TMPA
         LDA   #>BASE
         ADC   TMPA+1
         STA   TMPA+1
*
* MULTIPLY 8 * CHAR
*
         LDA   #8
         STA   MPRL
         LDA   #0
         STA   MPRH
         LDA   CHAR
         STA   MPDL
         LDA   #0
         STA   MPDH
         JSR   MULT16
         LDA   MPRL
         STA   TMPB
         LDA   MPRH
         STA   TMPB+1
*
* ADD LINE
*
         CLC
         LDA   TMPB
         ADC   LINE
         STA   TMPB
         LDA   TMPB+1
         ADC   #0
         STA   TMPB+1
*
* TMPA + TMPB = BYTE
*
         CLC
         LDA   TMPA
         ADC   TMPB
         STA   TMPB
         LDA   TMPA+1
         ADC   TMPB+1
         STA   TMPB+1
*
* BYTE=PEEK(BYTE)OR2^BIT
*
         LDX   BITT
         INX
         LDA   #0
         SEC
SQUARE   ROL
         DEX
         BNE   SQUARE
         LDY   #0
         ORA   (TMPB),Y
         STA   (TMPB),Y
         RTS
*
* CALCULATE CHCODE
* ADDRESS
GETADR   LDA   #0
         STA   CHCODE+1
         LDA   CHCODE
         CLC
         ASL   A
         ROL   CHCODE+1
         ASL   A
         ROL   CHCODE+1
         ASL   A
         ROL   CHCODE+1
         STA   CHCODE
*
         CLC
         LDA   CHCODE
         ADC   #<NEWADR
         STA   BPTR
         LDA   CHCODE+1
         ADC   #>NEWADR
         STA   BPTR+1
         RTS
*
* DRAW A CHARACTER
*
DRAWCH   LDA   LTTR
         STA   CHCODE
         JSR   GETADR
*
* A NESTED LOOP:
*
* (X IS THE OUTSIDE
* LOOP)
         LDX   #8
*
* DRAW 2 VERT LINES
*
SETLIN   LDA   #2
         STA   COUNT
*
DRAWLN   LDY   #0
         LDA   (BPTR),Y
         STA   ONEBYT
*
* THE INSIDE LOOP:
*
* (Y IS ZERO AT START)
*
RSHIFT   LDA   ONEBYT
         ASL   A
         STA   ONEBYT
         BCS   SHOW
*
         INC   HPSN
         BNE   ITSOK
         INC   HPSN+1
ITSOK    JMP   NOSHOW
*
* DISPLAY BIT
*
* SAVE X AND Y REGISTERS
*
SHOW     TXA
         PHA
         TYA
         PHA
*
         JSR   PLOT
*
* NOW DO IT AGAIN
*
         INC   HPSN
         BNE   NOINC
         INC   HPSN+1
*
NOINC    JSR   PLOT
*
* RETRIEVE X, Y
* REGISTERS
         PLA
         TAY
         PLA
         TAX
*
NOSHOW   INC   HPSN
         BNE   LEAP
         INC   HPSN+1
*
LEAP     INY
         CPY   #8
         BCC   RSHIFT
*
         INC   VPSN
*
         LDA   HPTR
         STA   HPSN
         LDA   HPTR+1
         STA   HPSN+1
*
* 2 VERT LINES DONE YET?
```

```
*
         DEC   COUNT
         BNE   DRAWLN
*
         INC   BPTR
         BNE   OKMSB
         INC   BPTR+1
OKMSB    DEX
         BNE   SETLIN
         RTS
*
* COPY CHR SET INTO RAM
*
* PUT DATA IN NEW SPOT
*
COPYCHRS LDA   #<CHRBAS
         STA   MSRC
         LDA   #>CHRBAS
         STA   MSRC+1
*
         LDA   #<NEWADR
         STA   MDST
         LDA   #>NEWADR
         STA   MDST+1
*
         LDA   #<TABLEN
         STA   LENPTR
         LDA   #>TABLEN
         STA   LENPTR+1
*
         LDY   #0
         LDX   LENPTR+1
         BEQ   MVPART
MVPAGE   JSR   GETDATA
         INY
         BNE   MVPAGE
         INC   MSRC+1
         INC   MDST+1
         DEX
         BNE   MVPAGE
MVPART   LDX   LENPTR
         BEQ   MVEXIT
MVLAST   JSR   GETDATA
         INY
         DEX
         BNE   MVLAST
MVEXIT   RTS
*
* USE INDFET ROUTINE
*
GETDATA  PHA
         TXA
         PHA
         LDA   #MSRC
         LDX   #14
         JSR   INDFET
         STA   (MDST),Y
         PLA
         TAX
         PLA
         RTS
*
*
* MAIN ROUTINE
*
START    JSR   COPYCHRS
*
         LDA   #$20
         STA   $D8
*
* USE VIDEO BANK 2
*
         LDA   #0
         STA   $FF00
         LDA   CI2PRA
         AND   #$FC
         ORA   #$02
         STA   CI2PRA
         STA   $FF01
*
* SCREEN MAP AT $6000,
* COLOR MAP AT $5C00
*
         LDA   #$78
         STA   SVMCSB
*
* CLEAR BIT MAP
*
         LDA   #0
         STA   FILVAL
         LDA   #<BASE
         STA   TPTR
         LDA   #>BASE
         STA   TPTR+1
         LDA   #<SCRLEN
         STA   TABSIZ
         LDA   #>SCRLEN
         STA   TABSIZ+1
         JSR   BLKFIL
*
* SET COLORS
*
         LDA   #COLOR
         STA   FILVAL
         LDA   #<COLMAP
         STA   TPTR
         LDA   #>COLMAP
         STA   TPTR+1
         LDA   #<MAPLEN
         STA   TABSIZ
         LDA   #>MAPLEN
         STA   TABSIZ+1
         JSR   BLKFIL
         LDA   #13
         STA   BORDER
*
* POSITION MESSAGE ON
* SCREEN
         LDA   #8
         STA   HPSN
         STA   HPTR
         LDA   #0
         STA   HPSN+1
         STA   HPTR+1
         LDA   #VMID
         STA   VPSN
         STA   VPTR
*
* PRINT LARGE TYPE
*
         LDX   #0
DISP     LDA   TEXT,X
         CMP   #0
         BEQ   DONE
         STA   LTTR
         TXA
         PHA
         JSR   DRAWCH
         PLA
         TAX
*
* ADVANCE CURSOR
*
         CLC
         LDA   HPTR
         ADC   #16
         STA   HPTR
         STA   HPSN
         LDA   HPTR+1
         ADC   #0
         STA   HPTR+1
         STA   HPSN+1
         LDA   VPTR
         STA   VPSN
*
* PRINT NEXT LETTER
*
         INX
         JMP   DISP
*
DONE     JMP   DONE
```


**PROGRAMS NEEDED!**

Send yours on disk, accompanied by a program printout, documentation, and a stamped, self-addressed envelope to:

*Ahoy!* Program Submissions
Ion International Inc.
45 West 34th Street—Suite 407
New York, NY 10001

# TENPINS

## FROM PAGE 77

**Starting address in hex: C000**
**Ending address in hex: C71E**
**SYS to start: 49152**

***Flankspeed* required for entry! See page 121.**

```
C000: A9 FF A0 00 99 40 3E C8 2B
C008: C0 2A 90 F8 A9 00 99 40 FF
C010: 3E C8 C0 40 90 F8 A8 B9 04
C018: DF C5 99 80 3E C8 D0 F7 A7
C020: B9 DF C6 99 80 3F C8 C0 63
C028: 40 90 F5 A9 00 99 80 3F F1
C030: C8 10 FA A9 78 8D EF 3F E2
C038: 8D FB 3F A9 FC 8D F2 3F 67
C040: 8D F5 3F 8D F8 3F A0 18 81
C048: B9 D0 C4 99 00 D4 88 10 9E
C050: F7 8C F9 07 C8 8C 20 D0 1C
C058: 8C 25 D0 8C 28 D0 C8 8C B5
C060: 1C D0 A0 0A 8C 26 D0 C8 44
C068: 8C 29 D0 A9 04 8D 1B D0 16
C070: 8D 1D D0 8D 04 D0 A9 F9 F1
C078: 8D FA 07 78 A9 7F 8D 0D 44
C080: DC A9 01 8D 1A D0 8D 12 20
C088: D0 A9 1B 8D 11 D0 A9 66 9D
C090: 8D 14 03 A9 C4 8D 15 03 49
C098: 58 A9 00 8D 15 D0 A9 75 2D
C0A0: A0 C5 20 1E AB A9 B7 20 72
C0A8: 3D C4 A0 01 84 05 84 FB 56
C0B0: A2 04 C8 18 20 F0 FF A9 F2
C0B8: 20 20 D2 FF 20 D2 FF A6 65
C0C0: FB A9 00 20 CD BD E6 FB F4
C0C8: A5 FB C9 0B 90 E9 A9 6D D0
C0D0: A0 C5 20 1E AB A2 08 8A 56
C0D8: 29 01 A8 B9 BC C4 20 D2 D9
C0E0: FF 20 D2 FF A0 0C 20 D2 73
C0E8: FF 48 BD BE C4 20 D2 FF 65
C0F0: 68 20 D2 FF 88 D0 EF 20 B5
C0F8: D2 FF BD C7 C4 20 D2 FF 09
C100: CA 10 D4 A9 C4 20 3D C4 40
C108: A9 08 8D 86 02 A9 0D 20 A6
C110: D2 FF A9 B7 20 3D C4 A2 09
C118: 17 A0 00 18 20 F0 FF A9 A2
C120: C4 20 3D C4 A2 13 A0 0D 6A
C128: 18 20 F0 FF A9 3D A0 C5 9E
C130: 20 1E AB A9 00 85 C6 A5 B5
C138: A2 29 10 0A 0A 0A 09 20 5B
C140: 8D 13 07 20 E4 FF C9 31 E7
C148: 90 ED C9 35 B0 E9 20 D2 53
C150: FF 29 0F 8D A3 C4 A2 00 21
C158: 20 79 C3 A2 13 20 FF E9 75
C160: A9 07 8D 15 D0 A9 00 85 B3
C168: 04 A4 04 B9 A7 C4 8D 27 EF
C170: D0 B9 AC C4 8D 05 D0 BE 8E
C178: B8 C4 A5 05 0A 18 65 05 2D
C180: A8 C8 18 20 F0 FF 20 3F 7A
C188: C2 A0 00 20 24 C4 20 D2 E7
C190: FF C9 D6 D0 05 A9 2D 4C 2A
C198: A2 C1 20 52 C2 A0 01 20 F3
C1A0: 24 C4 20 D2 FF 20 82 C3 E2
C1A8: A2 02 A0 1E B1 02 C9 2D B6
C1B0: F0 05 CA C9 4E D0 5C 8E 45
C1B8: A4 C4 8A 09 30 8D 5D C5 96
C1C0: BD 6A C5 8D 69 C5 A9 5D 72
C1C8: A0 C5 20 46 C4 A9 5D A0 02
C1D0: C5 20 46 C4 A4 04 BE B8 E1
C1D8: C4 A0 22 18 20 F0 FF 20 A9
C1E0: 3F C2 A0 00 20 24 C4 20 AC
C1E8: D2 FF C9 D6 D0 12 A9 2D 16
C1F0: 20 D2 FF A9 1D 20 D2 FF 9D
C1F8: CE A4 C4 D0 E2 4C 10 C2 04
C200: CE A4 C4 F0 0B 20 52 C2 69
C208: A0 01 20 24 C4 20 D2 FF A5
C210: 20 82 C3 E6 04 A5 04 CD D8
C218: A3 C4 B0 03 4C 69 C1 E6 92
C220: 05 A5 05 C9 0B B0 03 4C A4
C228: 65 C1 A9 00 85 C6 A9 4F 3E
C230: A0 C5 20 46 C4 20 E4 FF C6
C238: C9 00 F0 F2 4C 99 C0 A0 2D
C240: 09 BE E9 C4 B9 F3 C4 9D C6
C248: F6 06 A9 01 9D F6 DA 88 E7
C250: 10 EF A9 D6 8D A2 C4 A9 6F
C258: 00 8D 10 D0 8D 03 D0 85 AD
C260: FB A9 1B 8D 00 D0 A9 FE 28
C268: 8D F8 07 AD 00 DC 29 03 AC
C270: A8 18 B9 9B C4 6D A2 C4 20
C278: C9 A7 90 07 C9 D7 B0 03 D6
C280: 8D A2 C4 A2 0A 20 79 C3 7F
C288: AD 00 DC 29 10 D0 DC A0 9A
C290: 03 A2 3A 20 79 C3 CE F8 95
C298: 07 EE 00 D0 88 10 F2 AD 98
C2A0: A2 C4 8D 03 D0 A9 25 8D C5
C2A8: 02 D0 A9 81 8D 04 D4 AD BA
C2B0: 1F D0 AD 02 D0 29 1F D0 3A
C2B8: 18 AD 00 DC 29 03 AA AD DF
C2C0: 03 D0 C9 A7 90 0B C9 D7 43
C2C8: B0 07 18 7D 9B C4 8D 03 07
C2D0: D0 EE 02 D0 D0 05 A9 02 E4
C2D8: 8D 10 D0 C0 0A 90 2D 98 68
C2E0: 10 5E AD 1F D0 29 02 F0 09
C2E8: 57 A2 80 8E 0B D4 8E 12 72
C2F0: D4 E8 8E 0B D4 8E 12 D4 92
C2F8: 38 AD 03 D0 E9 AF 0A AA 01
C300: BD FD C4 8D 9F C4 BD FE 2F
C308: C4 8D A0 C4 C8 C0 0A B0 04
C310: 17 4E A0 C4 6E 9F C4 90 3E
C318: F3 BE E9 C4 A9 20 DD F6 18
C320: 06 F0 E9 9D F6 06 E6 FB 7E
C328: 98 29 01 49 01 0A 48 0A 91
C330: 0A 8D 0F D4 68 18 69 07 9C
C338: 8D 08 D4 A2 02 20 79 C3 A4
C340: A2 03 20 79 C3 AD 10 D0 D1
C348: F0 07 AD 02 D0 C9 50 B0 8B
C350: 03 4C B2 C2 A9 80 8D 04 D0
C358: D4 A9 D7 8D 03 D0 A2 02 B4
```

```
C360: 20 79 C3 AC 02 D0 D0 03 11
C368: 8C 10 D0 CE 02 D0 AD 10 35
C370: D0 D0 EB 88 C0 2D B0 E6 0C
C378: 60 EE A1 C4 D0 FB CA D0 96
C380: F8 60 A4 04 B9 B0 C4 85 37
C388: 02 B9 B4 C4 85 03 BE B8 BD
C390: C4 A0 00 84 FD 84 FE 18 14
C398: 20 F0 FF A0 01 84 A7 A5 1D
C3A0: A7 0A 18 65 A7 A8 20 04 44
C3A8: C4 85 A8 8A C9 20 F0 1F 20
C3B0: A2 02 C9 2D F0 27 CA C9 F8
C3B8: 4E F0 22 A5 A8 20 18 C4 65
C3C0: 88 20 04 C4 20 18 C4 E6 16
C3C8: A7 A5 A7 C9 0B 90 D0 EE E2
C3D0: 86 02 A6 FD A5 FE 20 CD 90
C3D8: BD CE 86 02 60 8E AB C4 4D
C3E0: C8 C8 20 04 C4 E0 20 F0 4D
C3E8: E6 E0 56 D0 02 C8 C8 18 83
C3F0: 65 A8 85 A8 CE AB C4 D0 3D
C3F8: E8 A5 A8 E0 4E D0 02 A9 DB
C400: 14 4C C4 C3 B1 02 AA C9 11
C408: 56 F0 08 C9 4E F0 04 C9 2E
C410: 2D D0 02 A9 0A 29 0F 60 5C
C418: 18 65 FD 85 FD A5 FE 69 25
C420: 00 85 FE 60 A6 FB 98 F0 31
C428: 05 8A 18 65 FC AA 86 FC 60
C430: E0 0A 90 04 B9 A5 C4 60 34
C438: A5 FB 09 30 60 A0 27 20 5B
C440: D2 FF 88 10 FA 60 48 98 E7
C448: 48 A2 0F A0 0E 18 20 F0 1A
C450: FF 68 A8 68 20 1E AB A2 56
C458: 00 20 79 C3 A2 0F 20 FF 87
C460: E9 A2 C8 4C 79 C3 A2 01 E2
C468: 8E 19 D0 A0 09 AD 12 D0 1B
C470: 30 0C A2 A5 A0 0C C9 5E C9
C478: B0 04 A2 5E A0 06 8E 12 75
C480: D0 8C 21 D0 E0 A5 D0 06 2D
C488: AD A2 C4 8D 01 D0 AD 0D B7
C490: DC 29 01 F0 03 4C 31 EA F3
C498: 4C BC FE 00 01 FF 00 00 A1
C4A0: 00 00 00 00 00 D6 CE 03 49
C4A8: 0D 0E 07 00 5F 6F 7F 8F A8
C4B0: F2 42 92 E2 04 05 05 05 6E
C4B8: 06 08 0A 0C C3 20 B1 C2 35
C4C0: DB C2 DB C2 DB C2 B2 BD 0D
C4C8: C2 B3 C2 B3 C2 B3 C2 B2 A1
C4D0: 18 12 00 00 80 09 6A 96 85
C4D8: 08 00 00 00 0A 00 C8 00 B3
C4E0: 00 00 00 0A 00 00 1B A1 A7
C4E8: 1F 26 27 4F 28 00 50 29 46
C4F0: 51 01 79 7B 7E 7E 7B 7B 2C
C4F8: 7B 7E 7E 7E 7E 00 01 00 6F
C500: 01 00 01 00 01 50 01 50 A4
C508: 01 50 01 50 01 DA 01 DA 62
C510: 01 DA 01 52 01 FF 03 FF 43
C518: 02 EF 00 FF 00 FF 00 DF E9
C520: 00 FF 01 FF 03 A4 02 EC B7
C528: 02 EC 02 EC 02 A0 02 A0 4B
C530: 02 A0 02 A0 02 00 02 00 79
C538: 02 00 02 00 02 90 50 4C 6B
C540: 41 59 45 52 53 20 28 31 3F
C548: 2D 34 29 20 20 9D 00 50 01
C550: 52 45 53 53 20 41 4E 59 97
C558: 20 4B 45 59 00 31 20 45 F8
C560: 58 54 52 41 20 52 4F 4C AE
C568: 4C 20 00 20 53 20 2A 20 B2
C570: 20 2A 90 0D 00 8E 08 93 82
C578: 20 20 20 20 20 20 20 20 79
C580: 9F B0 B2 AE 20 B2 C3 AE 77
C588: 20 B2 C3 C9 20 B2 C3 C9 49
C590: 20 B2 20 B2 C3 C9 20 D5 B9
C598: C3 C9 0D 20 20 20 20 20 D3
C5A0: 20 20 20 20 C2 20 20 AB CF
C5A8: C3 20 20 C2 20 C2 20 AB 1E
C5B0: C3 CB 20 C2 20 C2 20 C2 E8
C5B8: 20 CA C3 C9 0D 20 20 20 9E
C5C0: 20 20 20 20 20 20 B1 20 53
C5C8: 20 B1 C3 BD 20 BD 20 AD C7
C5D0: 20 B1 20 20 20 B1 20 BD 92
C5D8: 20 AD 20 CA C3 CB 0D 00 2E
C5E0: 01 50 00 05 FC 00 05 FF 39
C5E8: 00 0F FC 00 03 F0 00 2A 13
C5F0: C0 00 AA 80 02 8A 80 02 EB
C5F8: 8A 80 00 AA 80 00 2D 40 9C
C600: 00 0D 40 00 05 00 00 05 57
C608: 00 00 05 00 00 05 00 00 12
C610: 05 00 00 05 00 00 0A 00 24
C618: 00 05 40 00 00 00 26 00 83
C620: 00 00 00 00 00 00 00 00 20
C628: 00 01 50 00 05 FC 00 05 80
C630: FF 00 0F FC 00 03 F0 00 30
C638: 0A C0 00 2A 80 00 2A 80 58
C640: 00 29 80 00 29 80 00 1A AD
C648: 40 00 16 B0 00 15 BC 06 27
C650: 55 50 06 54 50 04 00 A0 45
C658: 04 00 54 00 00 00 00 00 B0
C660: 00 00 00 00 00 00 05 40 A5
C668: 00 17 F0 00 17 FC 00 3F C3
C670: F0 00 0F C0 0A AB 00 2A 11
C678: AA 00 38 2A 00 1C 2A B0 7C
C680: 54 2A 00 54 2A 00 54 15 E6
C688: 40 10 15 50 00 55 50 06 E9
C690: 54 50 06 50 50 04 00 A0 80
C698: 04 00 54 00 00 00 00 00 F0
C6A0: 00 00 00 54 00 01 7F 00 75
C6A8: 01 7F C0 03 FF 00 00 FC E9
C6B0: 00 02 B0 00 0A A0 00 0A 18
C6B8: A0 00 0A 60 00 0A 60 40 6E
C6C0: 06 9D 50 05 AF 50 01 55 10
C6C8: 50 01 54 40 19 54 00 19 35
C6D0: 54 00 10 14 00 10 28 00 81
C6D8: 00 15 00 00 00 00 00 05 F2
C6E0: 40 00 17 F0 00 17 FC 00 3D
C6E8: 3F F0 00 0F C0 00 2B 01 15
C6F0: 00 AA 05 40 A6 F5 40 A5 63
C6F8: F5 40 AA 81 00 55 00 00 B0
```

**IMPORTANT!** Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 119 and 120 explain these codes and provide other essential information on entering *Ahoy!* programs. Refer to these pages **before** entering any programs!

```
C700: 55 00 00 54 00 00 14 00 BD
C708: 00 14 00 00 14 00 00 14 44
C710: 00 00 14 00 00 28 00 00 4C
C718: 15 00 00 00 00 00 00 2D
```

# TONS OF DATA
## FROM PAGE 20

### DATAWRITER (C-128)

```
·1 REM                                     JD
·2 REM            DATAWRITER               JP
·3 REM        RUPERT REPORT #35            ON
·4 REM                                     JD
·5 REM      *** C-128 VERSION ***          MN
·6 REM                                     JD
·7 REM =================================== IO
·10 EE$=CHR$(27)+"J"+CHR$(27)+"Q"   :REM
 LINE ERASER                               CB
·20 F$="TIME1"   :REM  DEFAULT FILENAME    HK
·30 DOPEN#8,(F$),W                         MG
·40 DD=DS : IF DD<>0 THEN GOTO 1000        LJ
·50 REM ********************************** DD
·60 REM   THIS LOOP GENERATES THE DATA     KI
·70 REM       AND WRITES IT TO DISK        JH
·80 REM ---------------------------------- DD
·90 FOR N=1 TO 100                         PA
·100 T2=TI[UPARROW]2                       LA
·110 PRINT#8,T2                            IM
·120 SS=ST: IF SS<>0 THEN 1000             IG
·130 PRINT EE$;N; :REM SHOW ACTIVITY       FO
·140 NEXT                                  IA
·150 REM --------------------------------- DD
·160 REM              END OF LOOP          DL
·170 REM ********************************* DD
·180 DCLOSE                                AM
·190 END                                   IC
·1000 REM  -- ERROR HANDLER --             JB
·1010 DCLOSE : IF DD=63 THEN 1030          PP
·1020 PRINT :PRINT DS$ :PRINT "I/O STATUS
 ERROR # ";SS : END                        MB
·1030 PRINT "FILE "F$" EXISTS."            AC
·1040 A$="" : INPUT "DO YOU WANT TO WRITE
 OVER IT (Y/N) (RETURN TO EXIT)";A$        GJ
·1050 IF A$="" THEN END                    BA
·1060 IF A$="Y" THEN SCRATCH(F$) :GOTO 30  LL
·1070 IF A$<>"N" THEN 1040                 EE
·1080 INPUT"WHAT FILENAME DO YOU WANT";F$  BC
·1090 GOTO 30                              OJ
```

### DATAREADER (C-128)

```
·1 REM                                     JD
·2 REM            DATAREADER               IJ
·3 REM        RUPERT REPORT #35            ON
·4 REM                                     JD
·5 REM      *** C-128 VERSION ***          MN
·6 REM                                     JD
·7 REM =================================== OM
·200 F$="XX"  :REM  PUT DEFAULT NAME HERE  FN
·210 DOPEN#8,(F$)                          DM
·220 DD=DS : IF DD<>0 THEN GOTO 2000       LE
·230 REM ********************************* DD
·240 REM     THIS LOOP READS DATA          GK
·250 REM      AND MANIPULATES IT           GG
·260 REM --------------------------------- DD
·270 DO                                    OP
·280 :N=N+1 : D0=D                         BA
·290 :INPUT#8,D                            GI
·300 :SS=ST:IF SS<>64 AND SS<>0 THEN 2000  LE
·310 :PRINT N,D,D-D0                       BC
·320 LOOP UNTIL SS=64                      LL
·330 REM --------------------------------- DD
·340 REM           END OF LOOP             DL
·350 REM ********************************* DD
·360 DCLOSE                                AM
·370 END                                   IC
·2000 REM   --- ERROR HANDLER ---          OI
·2010 DCLOSE : IF DD=62 THEN 2030          NN
·2020 PRINT :PRINT DS$ :PRINT "I/O STATUS
 ERROR # ";SS : END                        MB
·2030 PRINT "FILE  "F$"  DOES NOT EXIST."  EI
·2040 F$="":INPUT"WHAT FILENAME DO YOU WA
NT (D FOR DIRECTORY; RETURN TO QUIT)";F$   EG
·2050 IF F$="" THEN END                    CF
·2060 IF F$="D" THEN DIRECTORY :GOTO 2040  HC
·2070 GOTO 210                             BP
```

### DATAWRITER (C-64)

```
·1 REM                                     JD
·2 REM         DATAWRITER - 64             DP
·3 REM        RUPERT REPORT #35            ON
·4 REM                                     JD
·5 REM      *** C-64  VERSION ***          IJ
·6 REM                                     JD
·7 REM =================================== IO
·20 F$="TIME1"   :REM  DEFAULT FILENAME    HK
·30 OPEN15,8,15:OPEN8,8,8,F$+",W"          BI
·40 INPUT#15,DS,DS$ :DD=DS :IF DD<>0 THEN
 GOTO 1000                                 MB
·50 REM ********************************** DD
·60 REM   THIS LOOP GENERATES THE DATA     KI
·70 REM       AND WRITES IT TO DISK        JH
·80 REM ---------------------------------- DD
·90 FOR N=1 TO 100                         PA
·100 T2=TI[UPARROW]2                       LA
·110 PRINT#8,T2                            IM
·120 SS=ST: IF SS<>0 THEN 1000             IG
·130 PRINT N; :REM SHOW ACTIVITY           NL
·140 NEXT                                  IA
```

```
•150 REM ---------------------------------- DD
•160 REM              END OF LOOP          DL
•170 REM ********************************** DD
•180 CLOSE8:CLOSE15                        BG
•190 END                                   IC
•1000 REM      -- ERROR HANDLER --         JB
•1010 CLOSE8 :CLOSE15 :IF DD=63 THEN 1030  BB
•1020 PRINT :PRINT DS$ :PRINT "I/O STATUS
 ERROR # ";SS : END                        MB
•1030 PRINT "FILE "F$" EXISTS."            AC
•1040 A$="" : INPUT "DO YOU WANT TO WRITE
 OVER IT (Y/N) (RETURN TO EXIT)";A$        GJ
•1050 IF A$="" THEN END                    BA
•1060 IF A$="Y" THEN OPEN15,8,15,"S:"+F$:
CLOSE15 : GOTO 30                          KH
•1070 IF A$<>"N" THEN 1040                 EE
•1080 INPUT"WHAT FILENAME DO YOU WANT";F$  BC
•1090 GOTO 30                              OJ
```

## DATAREADER (C-64)

```
•1 REM                                     JD
•2 REM          DATAREADER - 64            DB
•3 REM         RUPERT REPORT #35           ON
•4 REM                                     JD
•5 REM       *** C-64  VERSION ***         IJ
•6 REM                                     JD
•7 REM ================================== OM
•200 F$="XX"                               BH
•210 OPEN15,8,15 : OPEN8,8,8,F$            LG
•220 INPUT#15,DS,DS$ :DD=DS:IF DD<>0 THEN
 GOTO 2000                                 MK
•230 REM ********************************** DD
•240 REM      THIS LOOP READS DATA         GK
•250 REM       AND MANIPULATES IT          GG
•260 REM ---------------------------------- DD
•270 REM                                   JD
•280 :N=N+1 : D0=D                         BA
•290 :INPUT#8,D                            GI
•300 :SS=ST:IF SS<>64 AND SS<>0 THEN 2000  LE
•310 :PRINT N,D,D-D0                       BC
•320 IF SS<>64 THEN 280                    GL
•330 REM ---------------------------------- DD
•340 REM            END OF LOOP            DL
•350 REM ********************************** DD
•360 CLOSE8 : CLOSE15                      BG
•370 END                                   IC
•2000 REM     --- ERROR HANDLER ---        OI
•2010 CLOSE8 :CLOSE15 :IF DD=62 THEN 2030  AP
•2020 PRINT :PRINT DS$ :PRINT "I/O STATUS
 ERROR # ";SS : END                        MB
•2030 PRINT "FILE "F$" DOES NOT EXIST." :
 F$=""                                     GM
•2040 INPUT"WHAT FILENAME DO YOU WANT (RE
TURN TO QUIT)";F$                          OI
•2050 IF F$="" THEN END                    CF
•2060 GOTO 210                             BP
```

# SYNTAX PATROL FROM PAGE 52

**Starting address in hex: C738**
**Ending address in hex: CC27**
**SYS to start: 51000**

***Flankspeed* required for entry! See page 121.**

```
C738: A9 C9 CD 03 03 D0 48 AD 46
C740: BD CB D0 23 A2 05 BD B6 D9
C748: CB 9D 68 C0 CA 10 F7 A9 57
C750: AD A2 4C A0 93 8D 00 C0 6F
C758: 8E AA C0 8E FB C0 8C 7C A6
C760: C1 20 6E C7 4C 68 C1 A9 98
C768: 83 A2 A4 20 90 CB 20 56 26
C770: CA A9 8B A2 E3 A0 03 4C E6
C778: 97 CB B9 BD CB F0 07 20 37
C780: D2 FF C8 4C 7A C7 60 20 2B
C788: 44 E5 A2 01 A0 0E 18 20 3D
C790: F0 FF A0 01 20 7A C7 20 A5
C798: E4 FF C9 4E D0 11 8D BD C2
C7A0: CB 20 A7 C7 4C F4 C7 20 25
C7A8: D2 FF A0 3B 4C 7A C7 C9 AF
C7B0: 59 D0 E4 20 A7 C7 8D BD 9A
C7B8: CB A2 04 A0 3F BD B0 CB 45
C7C0: DD 47 C0 D0 B5 CA 10 F5 FD
C7C8: A9 EA A2 02 9D 19 C0 9D 17
C7D0: 68 C0 9D 6B C0 9D 0F C1 32
C7D8: 9D 12 C1 CA 10 EE A9 60 1E
C7E0: 8D 00 C0 8D AA C0 8D FB B1
C7E8: C0 A9 0D 8D 7C C1 20 0F 5B
C7F0: C0 20 7A CA A9 A0 A2 00 04
C7F8: A0 E0 85 FC 86 FB 86 FD 04
C800: 84 FE A1 FB 81 FB A1 FD 3E
C808: 81 FD E6 FB E6 FD D0 F2 13
C810: E6 FC E6 FE D0 EC A9 4C 8D
C818: 8D 96 A4 8D 9C A4 8D 49 86
C820: A7 8D 5D A7 8D 78 A7 8D 95
C828: A5 A7 8D 83 A8 8D 34 A9 9A
C830: 8D 57 A9 8D A5 AB 8D CB F6
C838: AB 8D B8 AA 8D 8D AB 8D 29
C840: 1E AD 8D FC B2 8D 48 B7 D6
C848: 8D 53 B8 8D EA B9 8D 2D CE
C850: E1 8D 59 E1 8D 6F E1 8D 67
C858: C1 E1 A9 0E A2 62 A0 B3 0D
C860: 8D 31 A9 8D FD B2 8E B0 46
C868: AA 8C FE B2 A9 50 A2 CA B8
C870: 8D 97 A4 8E 98 A4 A9 18 C7
C878: A2 CA 8D 9D A4 8E 9E A4 87
C880: A9 95 A2 CA 8D A1 A8 8E 93
C888: A2 A8 A9 01 A2 CB 8D 35 AF
C890: A9 8E 36 A9 A9 85 A2 CA 45
C898: 8D 58 A9 8E 59 A9 A9 A0 04
C8A0: A2 CA 8D 1F AD 8E 20 AD C4
C8A8: A9 09 A2 CB 8D 54 B8 8E F2
C8B0: 55 B8 A9 5D A2 CB 8D EB AD
C8B8: B9 8E EC B9 A9 37 A2 CA F5
```

```
C8C0: 8D CC A7 8E CD A7 A9 72 E2
C8C8: A2 CB 8D 49 B7 8E 4A B7 56
C8D0: A9 5C A2 CB 8D A4 BF 8E C5
C8D8: A5 BF A9 60 8D 10 03 8D 76
C8E0: 44 A6 8D BB A6 8D 59 A8 4B
C8E8: 8D 7A A8 8D C0 A8 8D D4 F2
C8F0: A8 8D A6 B3 8D AE B3 8D FE
C8F8: 27 B8 8D 3C B8 8D 50 B8 F1
C900: A2 00 8E CA A7 8E 57 AC 36
C908: 8E DB AC 8E 13 BB A9 45 6B
C910: 8D A1 AA A9 9D A2 AA 8D 0C
C918: B9 AA 8D 9B AC 8E BA AA 46
C920: A9 AE A2 A7 8D A6 A7 8D 2C
C928: 52 A8 8D 55 A8 8E 4B A7 30
C930: 8E 5F A7 8E 7A A7 8E A7 AC
C938: A7 8E 53 A8 8E 56 A8 A9 A1
C940: 5A A2 6D A0 92 8D 4A A7 5D
C948: 8E 5E A7 8C 79 A7 A9 A0 D4
C950: A2 A8 8D 84 A8 8E 85 A8 13
C958: A9 0F A2 B0 A0 0D 8D FF 9F
C960: B2 8E 00 B3 8C 01 B3 A9 40
C968: 85 A2 AB 8D A6 AB 8E A7 52
C970: AB A9 08 8D C2 AB A9 0B 7E
C978: A2 06 A0 AC 8D 81 AB 8E B7
C980: CC AB 8E 8E AB 8C 8F AB 89
C988: 8C CD AB 8C 9C AC A9 EA F8
C990: 9D 90 AA 9D A8 AB 9D AD A6
C998: AB 9D B3 AB CA 10 F1 8D 9B
C9A0: 4E A9 8D 11 AB 8D 12 AB 2E
C9A8: 8D 7B AB 8D 7C AB 8D 7D 1E
C9B0: AB 8D 56 B8 A9 F0 A2 03 39
C9B8: A0 05 8D D0 B4 8E D1 B4 86
C9C0: 8C 8F B7 A9 E7 A2 FF 8D 56
C9C8: 5A E1 8D 70 E1 8D C2 E1 17
C9D0: 8E 5B E1 8E 71 E1 8E C3 D0
C9D8: E1 A9 FE A2 C9 20 90 CB 4C
C9E0: A9 E9 A2 C9 A0 00 4C 97 65
C9E8: CB AD 00 02 C9 B2 F0 03 D4
C9F0: 4C 8B E3 20 61 CA A0 00 99
C9F8: 20 9D CB 4C 74 A4 20 56 5E
CA00: CA A5 2D A6 2E 85 2F 85 AC
CA08: 31 86 30 86 32 20 61 CA F4
CA10: A9 35 20 58 CA 4C 83 A4 A6
CA18: C9 30 90 0A C9 3A B0 06 67
CA20: 20 73 00 4C 18 CA A2 58 DD
CA28: BD 00 02 9D 22 CC CA 10 4F
CA30: F7 20 79 A5 4C E1 A7 20 5D
CA38: 56 CA A9 00 A2 58 A0 02 A0
CA40: 85 7A 84 7B BD 22 CC 9D 8A
CA48: 00 02 CA 10 F7 4C 9C A4 AA
CA50: 20 56 CA 4C 96 A4 A9 37 F9
CA58: A2 2F 78 85 01 86 00 58 08
CA60: 60 AD BD CB D0 FA 20 6F 53
CA68: CA 20 6F C0 4C 7A CA A2 B7
CA70: 03 BD 19 CC 95 FB CA 10 83
CA78: F8 60 A2 03 B5 FB 9D 19 DF
CA80: CC CA 10 F8 60 20 73 00 15
CA88: 20 95 CA 20 C7 CA C9 2C B1
CA90: D0 41 4C 85 CA C9 30 90 C9
CA98: 38 C9 3A B0 34 4C 6B A9 1B
CAA0: 20 C7 CA C9 41 90 2C C9 E4
CAA8: 5B B0 28 20 73 00 F0 28 89
CAB0: C9 2C D0 06 20 73 00 4C 5D
CAB8: A3 CA C9 30 90 15 C9 3A CA
CAC0: F0 16 90 E7 4C A3 CA 20 1B
CAC8: 79 00 F0 0A C9 3A F0 06 38
CAD0: 60 68 68 4C 08 AF 68 68 D6
CAD8: 4C AE A7 85 FD 86 FE A6 2B
CAE0: 7A E8 CA 30 EC BD 00 02 EB
CAE8: C5 FD D0 F6 E8 30 E2 BD 2E
CAF0: 00 02 C5 FE D0 F6 E8 30 98
CAF8: D8 BD 00 02 C9 20 F0 F6 63
CB00: 60 20 FF AE F0 CD 4C 40 7A
CB08: A9 A5 6A F0 23 C9 81 B0 D1
CB10: 1F A5 69 D0 1B A5 62 F0 23
CB18: 08 C9 81 B0 0B A5 61 D0 FE
CB20: 07 A9 88 85 69 4C 30 CB 90
CB28: A5 61 85 69 A5 62 85 6A 16
CB30: A5 66 49 FF 4C 57 B8 8E 70
CB38: 1F CC 20 DB CA 4C 43 CB 46
CB40: 20 F6 CA C9 00 F0 15 C9 BB
CB48: 30 90 F5 C9 3B 90 0D C9 6B
CB50: 41 90 ED C9 5B B0 E9 A9 79
CB58: 00 8D 1F CC 60 A9 BC A2 3B
CB60: 28 20 37 CB AD 1F CC D0 16
CB68: 03 4C F4 B9 20 2B BC 4C BA
CB70: ED B9 20 61 B7 86 FB 84 58
CB78: FC A9 CA A2 2C 20 37 CB DB
CB80: A6 FB A4 FC AD 1F CC D0 2F
CB88: 03 4C 4D B7 8A 4C 4B B7 B6
CB90: 8D 02 03 8E 03 03 60 8D A5
CB98: 00 03 8E 01 03 B9 A9 CB 5D
CBA0: F0 06 20 D2 FF C8 D0 F5 1A
CBA8: 60 4F 4E 00 4F 46 46 00 82
CBB0: 84 FE 20 0A C1 00 8D 02 AF
CBB8: 03 8E 03 03 00 4E 12 53 04
CBC0: 59 4E 54 41 58 20 50 41 08
CBC8: 54 52 4F 4C 0D 0D 44 4F B8
CBD0: 20 59 4F 55 20 57 41 4E F5
CBD8: 54 20 54 4F 20 55 53 45 FE
CBE0: 0D 0D 46 41 49 4C 53 41 AC
CBE8: 46 45 2C 20 54 4F 4F 3F F2
CBF0: 20 28 59 2F 4E 29 20 00 59
CBF8: 0D 0D 00 11 11 11 50 4C E2
CC00: 45 41 53 45 20 4C 4F 41 1C
CC08: 44 20 46 41 49 4C 53 41 1E
CC10: 46 45 2E 2E 2E 11 0D 00 44
CC18: 41 48 4F 59 21 21 21 00 AD
CC20: 00 00 00 00 00 00 00 00 20
```

**All programs in this issue of *Ahoy!* are available on disk. See page 93 for details.**

**IMPORTANT!** Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 119 and 120 explain these codes and provide other essential information on entering ***Ahoy!*** programs. Refer to these pages **before** entering any programs!

# TELEPORTER
## FROM PAGE 35

```
10 REM ****************************          CE
15 REM *      TELEPORTER          *          PB
20 REM *BY CLEVELAND M. BLAKEMORE*           PF
25 REM ****************************          CE
30 POKE53281,.:POKE53280,12:DIM A(63,2),
S$(48)                                        FN
35 VI=5:K=.:F=.:NB=.:NT=.:W=.:W$="":I$="
[WHITE]":C$=I$:D$=I$:C=.:CL=.:SB=.:SC=.:
L=.                                           DC
40 X$="[BLACK]":R$="[RVSON]"                 LJ
45 X=RND(-TI/37):PLOT=65520:PRINT"[CLEAR
][BLUE][3"[RIGHT]"] PLEASE WAIT[3"."]INI
TIALIZING GAME."                              OI
50 S$(.)="[c 8][RVSOFF]&[RVSON]CAPTAIN:[
30" "]":S$(1)=" STAND BY [5"."]"             LP
55 S$(2)="PREPARE FOR ":S$(3)="KRELL":S$
(4)="ALGON":S$(5)="BETA IV":S$(6)="CETA      PD
60 S$(7)="ALPHAN":S$(8)="SOL":S$(9)="TIR
US":S$(10)="AMBASSADOR":S$(11)="TRADER       CE
65 S$(12)="CREWMEMBER":S$(13)="PILOT":S$
(14)="ENGINEER":S$(15)="INSPECTOR            PP
70 S$(16)="OFFICER":S$(17)="PASSING THRU
 RADIATION STORM"                             BI
75 S$(18)=" $%&# COMPUTER ON THE FRITZ !
":S$(19)="TRANSMISSION GARBLED!"              AE
80 S$(20)="PHONY[3"."]":S$(21)="WE TRY T
O CONSERVE ENERGY HERE":S$(22)="LUNCHTIM
E                                             BB
85 S$(23)="METEOR BELT-TURBULENCE AHEAD"
:S$(24)="ANOTHER ALIEN FREELOADER."           OB
90 S$(25)="YOU JUST FRIED THE ":S$(26)="
YOU'RE FIRED!GET OFF MY SHIP!"                CA
95 S$(27)="GOOD JOB."                         LE
100 FORX=.TO10:READA$:S$(28+X)=A$:NEXT       FP
105 FORX=.TO9:READA$:S$(39+X)=A$:NEXT        BA
110 FORX=.TO32:READA:POKE679+X,A:NEXT        JK
115 POKE56334,PEEK(56334)AND254              DN
120 POKE1,PEEK(1)AND251:SYS679:POKE1,PEE
K(1)OR4:POKE56334,PEEK(56334)OR1              GD
125 READA:IFA=-1THEN135                       KJ
130 FORX=.TO7:READD:POKE61440+A*8+X,D:NE
XT:GOTO125                                    DE
135 POKE648,192:PRINT"[CLEAR][3"[DOWN]"]
[RIGHT][RIGHT][RVSON] WELCOME ABOARD THE
 U.S.S. NEFARIUS !"                           AN
140 POKE56576,PEEK(56576)AND252:POKE5327
2,12:V=53248:POKEV+21,.                       ID
145 D=49152:FORX=.TO319:READA:POKED+20*6
4+X,A:NEXT:POKEV,92:POKEV+1,208               ND
150 POKEV+8,240:POKEV+9,210:POKEV+23,27:
POKEV+43,14                                   PD
155 POKEV+27,23:POKEV+28,12:POKEV+29,27:
FORX=.TO48:POKED+25*64+X,255:NEXT             NI
160 FORX=48TO63:POKED+25*64+X,.:NEXT         GH
165 FORX=.TO63:POKED+26*64+X,255:NEXT        GA
170 POKEV+4,250:POKEV+5,216:POKED+1016,2
0:POKED+1017,26:POKED+1018,24                 EH
175 POKED+1019,24:POKEV+6,159:POKEV+7,13
3:POKEV+39,11:POKEV+40,PEEK(V+33)             LN
180 A=780:X=781:Y=782:P=783:POKEV+2,159:
GOSUB380                                      IM
185 POKEV+3,133:S=54272:FORSC=STOS+24:PO
KESC,.:NEXT                                   KP
190 GOSUB510:PRINTS$(.);                      EE
195 POKES+1,34:POKES,10:POKES+5,129:POKE
S+6,129:POKES+24,10:POKES+4,129               FH
200 POKEV+21,27:FORSC=26TO255:POKED+1016
,SC:POKED+1020,SC:NEXT:GOSUB550               PH
205 POKED+1020,25:POKED+1016,20:POKES+4,
.:GOSUB510:PRINTTAB(9)S$(1);                  CI
210 F=.:GOSUB640:R%=22+RND(0)*3:IFRND(1)
>.5THENF=1                                    BF
215 NB=INT(RND(1)*45+50):NT=INT(RND(1)*3
0+65)                                         LI
220 NB=NB+INT(RND(1)*10)/10:NT=NT+INT(RN
D(1)*10)/10:POKED+1018,R%                     BK
225 POKED+1019,R%:IFFANDRND(1)*7>LTHENPO
KED+1019,22+INT(RND(0)*3)                     BL
230 GOSUB550                                  CO
235 N$=S$(3+(RND(1)*7)):T$=S$(10+(RND(1)
*7)):N$=N$+CHR$(32)+T$                        FO
240 GOSUB510:PRINTTAB(9);CHR$(18);S$(2);
N$;CHR$(19):GOSUB550                          LM
245 POKEX,20:POKEY,16:POKEP,.:SYSPLOT:PR
INTI$;MID$(STR$(NB)+".0",2,4);                MG
250 POKEX,22:POKEY,16:POKEP,.:SYSPLOT:PR
INTMID$(STR$(NT)+".0",2,4);                   NE
255 POKED+1016,21:POKEV+37,RND(0)*10:POK
EV+38,RND(0)*10:POKEV+41,RND(0)*10            PD
260 POKEV+42,PEEK(V+41):IFFANDRND(1)*12>
LTHENPOKEV+42,RND(0)*10                       AA
265 POKEV+21,PEEK(V+21)OR4                    LH
270 W=INT(RND(0)*5)*2:W$=S$(39+W)             LE
275 POKEX,20:POKEY,23:POKEP,.:SYSPLOT:PR
INTW$;:GOSUB550                               GL
280 GOSUB640:IFL>12THENGOSUB565               DJ
285 GOSUB550:FORSC=STOS+24:POKESC,.:NEXT
:POKES,.:POKES+5,8                            EJ
290 POKES+6,123:POKES+24,15:POKES+4,21:S
C=133                                         BB
295 FORIR=.TO1:F1=PEEK(V+3):POKES+15,F1*
.1:POKES+1,F1*.01                             EH
300 EC=(INT(RND(1)*VI)+INT(RND(1)*8*F))*
.1:VI=-VI                                     HE
305 POKEX,20:POKEY,16:POKEP,.:SYSPLOT:PR
INTC$;MID$(STR$(NB+EC)+".0",2,4);             DP
310 PRINT"[DOWN][DOWN][4"[LEFT]"]";MID$(
STR$(NT+EC)+".0",2,4);                        JK
```

```
•315 IFSBTHENPOKEV+22,(PEEK(V+22)AND248)O
RRND(1)*8                                    NK
•320 POKEX,22:POKEY,23:POKEP,.:SYSPLOT:PR
INTD$;S$(39.6+W+ABS(EC)):NEXT                LG
•325 POKED+1016,21.5-ABS(EC)-(RND(1)*.1)     PI
•330 IFPEEK(56321)=239THEN615                CI
•335 SC=SC-1:POKEV+3,SC:IFSC>90THEN295       EC
•340 POKEV+22,(PEEK(V+22)AND248):POKES+4,
.                                            MI
•345 GOSUB510:PRINTS$(.);:GOSUB510           JA
•350 IFFTHENPRINTTAB(9)S$(24);:POKED+1016
,20:K=K+1:GOSUB640:GOSUB520:GOTO360          LM
•355 GOSUB550:PRINTTAB(9)S$(27);:POKED+10
16,21                                        HE
•360 L=L+1:GOSUB640:C$=I$:D$=I$:POKEV+21,
27:SB=.                                      OI
•365 IFL<21THENGOSUB550:GOTO185              DD
•370 IFK>6THENGOSUB510:PRINTS$(.);:GOSUB5
10:PRINTTAB(9);S$(26);                       LF
•375 GOTO650                                 CH
•380 PRINT"[CLEAR]"TAB(8)"[c 5][s M][22"[
c @]"][s N]                                  KL
•385 PRINTTAB(9)"[s T] [RVSON][sEP][3" "]
TELEPORTER[3" "][c *][RVSOFF] [s Y]          NA
•390 PRINTTAB(9)"[s T][RVSON][sEP][18"[c
@]"][c *][RVSOFF][s Y]                       CO
•395 PRINTTAB(9)"[s T][RVSON][20"[s V]"][
RVSOFF][s Y]                                 EI
•400 PRINTTAB(9)"[s T][4" "][s T][RVSON][
10"[c T]"][RVSOFF][s Y][4" "][s Y]           BF
•405 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[8"[s W]"] [RVSOFF][s Y][4" "][s Y]          CI
•410 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W][6" "][s W] [RVSOFF][s Y][4" "][s Y
]                                            IF
•415 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W]  [sEP][c *]  [s W] [RVSOFF][s Y][4
" "][s Y]                                    BO
•420 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W] [sEP]  [c *] [s W] [RVSOFF][s Y][4
" "][s Y]                                    ND
•425 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W] [c *]  [sEP] [s W] [RVSOFF][s Y][4
" "][s Y]                                    PC
•430 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W]  [c *][sEP]  [s W] [RVSOFF][s Y][4
" "][s Y]                                    ND
•435 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[s W][6" "][s W] [RVSOFF][s Y][4" "][s Y
]                                            FN
•440 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[8"[s W]"] [RVSOFF][s Y][4" "][s Y]          OF
•445 PRINTTAB(9)"[s T][4" "][s T][RVSON]
[9"[c @]"][RVSOFF][s Y][4" "][s Y]           KK
•450 PRINTTAB(8)"[s N][3"[c Y]"][RVSON][s
EP][s N] [s N][s O][6"[c Y]"][s P][s M]
[s M][c *][RVSOFF][3"[c Y]"][s M]            PB
•455 PRINTTAB(7)"[s N][3" "][RVSON][sEP][
s N][c @][s N][RVSOFF][sEP][8" "][c *][R
VSON][s M][c @][s M][c *][RVSOFF][3" "][
s M]                                         FH
•460 PRINTTAB(6)"[s N][3" "][RVSON][sEP][
18"[c @]"][c *][RVSOFF][3" "][s M]           EC
•465 PRINTTAB(5)"[s N][4" "][RVSON][20"[s
V]"][RVSOFF][4" "][s M]                      OG
•470 PRINTTAB(4)"[s N]"SPC(30)"[s M]"        OG
•475 PRINTTAB(3)"[s N]  [RVSON][sEP][c G]
[c A]HELM[s C][c R][5"[s C]"][c R][5"[s
C]"][c R]IMAGE[s C][c M][c *][RVSOFF] [s
M]                                           DA
•480 PRINTTAB(2)"[s N]  [RVSON][sEP][s Q]
[c G][s B][RVSOFF][5" "][RVSON][s B][c 6
]B[RVSOFF][c 5][4" "][RVSON][s B][c 6]R[
BACKARROW][RVSOFF][c 5][3" "][RVSON][s B
][RVSOFF][6" "][RVSON][c M][s Q][c *][RV
SOFF] [s M]                                  LK
•485 PRINT" [s N]  [RVSON][sEP][s Q] [c G
][s B][RVSOFF][5" "][RVSON][s B][c 6] [R
VSOFF][c 5][4" "][RVSON][s B][c 6]  [RVS
OFF][c 5][3" "][RVSON][s B][RVSOFF][6" "
][RVSON][c M] [s Q][c *][RVSOFF] [s M]       IH
•490 PRINT"[s N]  [RVSON][sEP][s W]  [c G
][s B][RVSOFF][5" "][RVSON][s B][c 6]T[R
VSOFF][c 5][4" "][RVSON][s B][c 6]W[BACK
ARROW][RVSOFF][c 5][3" "][RVSON][s B][RV
SOFF][6" "][RVSON][c M]  [s W][c *][RVSO
FF] [s M]";                                  OA
•495 PRINT"  [RVSON][sEP][s Q][3" "][c G]
[s B][RVSOFF][5" "][RVSON][s B][c 6] [RV
SOFF][c 5][4" "][RVSON][s B][c 6]  [RVSO
FF][c 5][3" "][RVSON][s B][RVSOFF][6" "]
[RVSON][c M][3" "][s Q][c *][RVSOFF] ";S
$(0);                                        NK
•500 PRINTCHR$(157);CHR$(148);CHR$(32);CH
R$(19);:RETURN                               FA
•505 REM SET CURSOR                          KC
•510 POKEP,.:POKEY,.:POKEX,24:SYSPLOT:RET
URN                                          KI
•515 REM ABORT/FRY ALIEN                     BM
•520 FORSC=STOS+24:POKESC,.:NEXT:POKES+1,
10:POKES+5,75:POKES+6,30:POKES,25            CK
•525 POKES+24,15:POKES+4,23:POKEV+3,90       ON
•530 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
AB(9)"[RVSON][c 8][s +] [s +] [s +] [s +
] [s +] ABORT ! [s +] [s +] [s +] [s +][
HOME]";                                      II
•535 FORSC=.TO64:PRINTCHR$(14);:POKEV+33,
SC:PRINTCHR$(142);:POKES+15,SC:NEXT          BM
•540 POKEV+3,133:POKES+4,.:GOSUB550:GOSUB
640:GOSUB510:PRINTS$(.);:RETURN              KP
•545 REM BEEP                                NA
•550 FORSC=STOS+24:POKESC,.:NEXT:POKES+24
,15                                          HB
•555 POKES+1,25:POKES,5:POKES+5,20:POKES+
6,20:POKES+4,33:FORSC=.TO75:NEXT             FI
•560 POKES+4,.:RETURN                        PF
```

**IMPORTANT!** Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 119 and 120 explain these codes and provide other essential information on entering ***Ahoy!*** programs. Refer to these pages **before** entering any programs!

```
•565 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
 AB(9);                                     IG
•570 ONL-12GOSUB580,605,580,585,590,595,6
 00,605                                     CH
•575 GOSUB640:GOSUB510:PRINTS$(.);:RETURN   IF
•580 C$=X$:PRINTS$(18);:RETURN              OP
•585 POKEV+21,30:PRINTS$(22);:RETURN        IE
•590 D$=X$:SB=1:PRINTS$(17);:RETURN         HI
•595 POKED+1018,RND(0)*3+22:PRINTS$(19);:
 RETURN                                     LH
•600 C$=X$:D$=X$:PRINTS$(21);:RETURN        GA
•605 SB=1:D$=X$:PRINTS$(23);:RETURN         AL
•610 REM CHECK FOR CORRECT ABORT            PM
•615 POKEV+22,PEEK(V+22)AND248              AB
•620 GOSUB520:GOSUB510:IFFTHENPRINTTAB(9)
 S$(20);:GOSUB510:GOTO0355                  IP
•625 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
 AB(9)S$(25);T$;"!";:K=K+1:GOSUB510         KA
•630 POKED+1016,20:GOSUB640:GOTO360         NF
•635 REM DELAY                              DG
•640 FORSC=.TO3000:NEXT:RETURN              BI
•645 REM RATE PERFORMANCE                   FD
•650 GOSUB550:GOSUB640:GOSUB550             BB
•655 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
 AB(9)R$;"RATING[s C][s C]>";               CD
•660 FORX=.TO10:IFX*2=20-KORX*2+1=20-KTHE
 NPRINTS$(28+X);:GOSUB550                   AN
•665 NEXT:GOSUB640:GOSUB640:GOSUB550        IC
•670 POKE648,4:POKE679,.:SYS679             BK
•675 REM RATINGS                            MI
•680 DATA RAW RECRUIT,SPACE CADET,ENSIGN,
 SPECIALIST,LIEUTENANT,1ST LIEUTENANT       DB
•685 DATA CAPTAIN,MAJOR,ADMIRAL,GALACTIC
 WHIZ KID,REGULAR RICKY ROCKET              CH
•690 REN WAVEFORM DATA                      LG
•695 DATA $$$,%%%,%$$,$%$,*(*,(*(,)(),()(
 ,$%%,%$$                                   FJ
•700 REM ML COPYDOWN ROUTINE                AK
•705 DATA 169,,133,251,133,253,169,208,13
 3,252,169,240,133,254,162,8                FE
•710 DATA 160,,177,251,145,253,136,208,24
 9,230,252,230,254,202,208,240,96           MA
•715 REM CHARACTER DATA                     KP
•720 DATA036,000,004,010,017,160,064,000,
 000                                        ML
•725 DATA037,000,032,080,136,005,002,000,
 000                                        IK
•730 DATA038,239,199,147,147,131,131,147,
 187                                        BM
•735 DATA040,000,056,040,040,239,000,000,
 000                                        AF
•740 DATA041,000,000,000,000,251,010,010,
 014                                        PG
•745 DATA042,000,016,040,040,199,000,000,
 000,-1                                     AK
•750 REM SPRITE DATA                        MM
•755 DATA255,255,255,135,255,193,143,254    BN
•760 DATA225,143,252,097,132,000,065,133    PO
•765 DATA147,065,132,214,065,134,016,193    GB
•770 DATA132,040,065,132,000,065,186,124    FC
•775 DATA189,197,069,067,130,130,129,129    FB
•780 DATA125,033,128,130,113,128,124,113    PD
•785 DATA128,000,081,128,000,001,128,000    NF
•790 DATA001,128,000,001,255,255,255,060    KP
•795 DATA255,255,255,135,255,193,143,254    BN
•800 DATA225,143,252,097,132,000,065,132    PP
•805 DATA214,065,132,016,065,134,016,193    EK
•810 DATA132,040,065,132,130,065,186,068    PJ
•815 DATA189,197,057,067,130,130,129,129    PC
•820 DATA125,033,128,130,113,128,124,113    PD
•825 DATA128,000,081,128,000,001,128,000    NF
•830 DATA001,128,000,001,255,255,255,060    KP
•835 DATA005,020,080,000,085,000,000,215    KE
•840 DATA000,000,125,000,000,020,000,001    NB
•845 DATA085,064,005,086,080,020,085,020    ID
•850 DATA080,085,005,064,150,001,064,170    PB
•855 DATA001,097,085,073,133,065,082,149    AG
•860 DATA000,086,020,000,020,020,000,020    MM
•865 DATA020,000,020,020,000,020,020,000    BM
•870 DATA020,028,000,052,252,000,063,044    LN
•875 DATA000,065,000,001,020,064,012,040    NN
•880 DATA048,000,020,000,000,065,000,000    EJ
•885 DATA020,000,000,020,000,001,085,064    HK
•890 DATA004,020,016,144,020,006,032,085    KA
•895 DATA008,129,020,066,004,020,016,004    ID
•900 DATA150,016,036,020,024,008,085,032    AE
•905 DATA032,085,008,001,215,064,005,085    OL
•910 DATA080,006,065,144,020,000,020,044    CG
•915 DATA000,000,000,001,065,064,007,215    ND
•920 DATA208,007,150,208,001,085,064,000    FJ
•925 DATA105,000,000,020,000,001,150,064    GP
•930 DATA005,105,080,020,105,020,016,105    PA
•935 DATA004,016,150,004,016,020,004,020    MC
•940 DATA020,020,016,020,004,004,085,016    IJ
•945 DATA000,085,000,001,065,064,005,000    NO
•950 DATA080,005,000,080,021,000,084,044    GC
```

# LONG LINES
## FROM PAGE 73

```
•100 REM *************************           OG
•110 REM *        LONG LINES       *         JJ
•120 REM * BY RICK NASH   5/28/86  *         EH
•130 REM *************************           OG
•140 REM                                     JD
•150 PRINTCHR$(147):PRINT:PRINTTAB(7)"-CH
ECKING DATA STATEMENTS-"                     CG
•160 CK=0:FORI=49152TO49337:READD:POKEI,D
:CK=CK+D:NEXT                                NE
```

```
·170 IFCK<>30183THENPRINT:PRINTTAB(8)"ERR
 OR IN DATA STATEMENTS":END                LD
·180 PRINTCHR$(147):PRINT:PRINTTAB(10)"DI
 SK OR TAPE (D/T) ";:INPUTA$               KN
·190 IFLEFT$(A$,1)="T"THENDV$="PREPARE TA
 PE":DV=1:GOTO220                          MH
·200 IFLEFT$(A$,1)="D"THENDV$="INSERT DIS
 K":DV=8:GOTO220                           EG
·210 GOTO180                               CN
·220 PRINT:PRINTTAB(4)DV$", THEN PRESS <R
 ETURN>"                                   CI
·230 GETA$:IFA$<>CHR$(13)THEN230           DG
·240 PRINT:PRINTTAB(13)"-WRITING FILE-     HJ
·250 F$="LONG LINES":POKE251,PEEK(71):POK
 E252,PEEK(72)                             HG
·260 AD=PEEK(251)+PEEK(252)*256            CC
·270 POKE183,PEEK(AD):POKE187,PEEK(AD+1):
 POKE188,PEEK(AD+2)                        BC
·280 POKE184,DV:POKE186,DV:POKE185,1       PE
·290 POKE251,0:POKE252,192:POKE780,251:PO
 KE781,186:POKE782,192:SYS65496            AF
·300 PRINTCHR$(147):PRINT:PRINTTAB(17)"DO
 NE!!":END                                 OJ
·310 DATA 169,0,168,133,251,133,253,162    FJ
·320 DATA 160,134,252,162,224,134,254,177  PB
·330 DATA 251,145,251,177,253,145,253,200  ED
·340 DATA 208,245,230,252,166,254,232,208  BI
·350 DATA 236,165,1,41,253,133,1,162       GN
·360 DATA 21,189,96,165,157,192,192,202    NO
·370 DATA 16,247,162,29,189,202,170,157    AI
·380 DATA 214,192,202,16,247,162,0,160     AN
·390 DATA 0,189,107,192,240,15,133,251     LN
·400 DATA 189,134,192,133,252,189,160,192  HB
·410 DATA 145,251,232,208,236,96,165,95    IA
·420 DATA 208,2,198,96,198,95,164,11       PF
·430 DATA 185,251,192,145,95,136,208,248   NN
·440 DATA 76,42,165,203,218,222,132,186    NL
·450 DATA 205,208,231,241,6,11,245,19      OP
·460 DATA 22,206,31,32,33,132,133,253      NE
·470 DATA 252,162,180,194,255,0,192,192    PC
·480 DATA 192,165,165,165,165,165,165,166  GB
·490 DATA 166,164,165,165,192,165,165,165  NO
·500 DATA 164,164,192,192,232,232,230,231  FH
·510 DATA 193,193,192,193,193,192,192,193  FN
·520 DATA 192,193,192,193,192,192,176,76   MA
·530 DATA 86,192,192,192,1,1,4,4           BH
·540 DATA 159,159                          BM
```

# DISCS OF DAEDALUS
## FROM PAGE 55

**Starting address in hex: C000**
**Ending address in hex: CC4F**
**SYS to start: 49152**

***Flankspeed* required for entry! See page 121.**

```
C000: A0 00 B9 1D C0 99 00 0C DD
C008: C8 C0 FF D0 F5 A0 00 B9 B2
C010: DD C0 99 C0 0C C8 C0 FF 9E
C018: D0 F5 4C 41 C3 00 00 00 30
C020: 00 00 00 00 00 00 00 00 20
C028: 00 00 00 00 00 00 00 00 28
C030: 00 00 00 00 00 00 00 00 30
C038: 00 00 00 00 00 00 00 00 38
C040: 00 04 00 20 08 7E 10 18 13
C048: FF 18 28 FF 14 08 FF 10 B4
C050: 7F 99 FE DF FF FB 7B FF BF
C058: DE 31 E7 8C 00 00 00 00 DC
C060: 00 00 00 00 00 00 00 00 60
C068: 00 00 00 00 00 00 00 00 68
C070: 00 00 00 00 00 00 00 00 70
C078: 00 00 00 00 00 00 00 00 78
C080: 00 00 01 FC 00 00 FE 00 7D
C088: 01 FE 00 70 0E 00 F8 0E 0E
C090: 0F FF FF 1F FF F7 3E 03 F7
C098: EF 7F FF FF 00 00 00 00 08
C0A0: 00 00 00 00 00 00 00 00 A0
C0A8: 00 00 00 00 00 00 00 00 A8
C0B0: 00 00 00 00 00 00 00 00 B0
C0B8: 00 00 00 00 00 00 00 00 B8
C0C0: 00 00 00 F0 00 01 FC 00 AF
C0C8: 00 F0 00 00 00 00 00 00 B9
C0D0: 00 00 00 00 00 00 00 00 D0
C0D8: 00 00 00 00 3F 00 00 00 18
C0E0: 00 00 00 00 00 00 00 00 E0
C0E8: 00 00 00 00 00 00 00 00 E8
C0F0: 00 00 00 00 00 00 00 00 F0
C0F8: 00 00 00 00 00 00 00 00 F8
C100: 00 00 00 00 01 80 00 01 82
C108: 80 00 0F F0 00 01 80 00 0A
C110: 01 80 00 02 40 00 02 40 16
C118: 00 06 60 00 06 00 00 00 84
C120: 00 00 00 00 00 00 00 00 20
C128: 00 00 00 00 00 00 00 00 28
C130: 00 00 00 00 00 00 00 00 30
C138: 00 00 00 00 00 00 00 00 38
C140: 00 00 00 00 09 90 00 05 DE
C148: A0 00 03 C0 00 01 80 00 2E
C150: 01 80 00 01 40 00 01 40 54
C158: 00 03 60 00 06 00 00 00 C1
C160: 00 00 00 00 00 00 00 00 60
C168: 00 00 00 00 00 00 00 00 68
C170: 00 00 00 00 00 00 00 00 70
C178: 01 20 00 01 E0 00 01 20 9C
C180: 00 00 00 00 00 00 00 00 80
C188: 00 00 00 00 00 00 00 00 88
C190: 00 00 00 00 00 00 00 00 90
C198: 00 00 00 00 00 00 E0 FC 76
C1A0: FE FF FE FC E0 00 00 00 7C
C1A8: 00 00 00 00 00 08 08 1C D4
C1B0: 7F 1C 08 08 00 FF FF FF 5C
C1B8: FF FF FF FF FF 20 20 20 19
C1C0: 20 20 20 10 15 13 08 20 81
C1C8: 0A 0F 19 13 14 09 03 0B 39
C1D0: 20 02 15 14 14 0F 0E 20 6D
C1D8: 14 0F 20 13 14 01 12 14 6A
```

```
C1E0: 07 01 0D 05 20 02 16 05 38
C1E8: 12 A0 00 A9 9F 85 FB A9 10
C1F0: 04 85 FC 18 A5 FB 69 01 9B
C1F8: 85 FB A5 FC 69 00 85 FC 09
C200: A9 20 91 FB A5 FB C9 E9 AC
C208: D0 E9 A5 FC C9 07 D0 E3 EA
C210: 60 A0 00 A9 9F 85 FB A9 85
C218: D8 85 FC 18 A5 FB 69 01 97
C220: 85 FB A5 FC 69 00 85 FC 30
C228: AD 40 03 91 FB A5 FB C9 12
C230: E9 D0 E8 A5 FC C9 DB D0 EC
C238: E2 60 20 E9 C1 A0 00 A9 91
C240: 20 99 00 04 C8 C0 A2 D0 FA
C248: F8 60 AD 25 04 C9 39 F0 6C
C250: 0A EE 25 04 AD 25 04 8D D6
C258: 25 04 60 A9 30 8D 25 04 72
C260: AD 25 04 C9 39 F0 0A EE 24
C268: 24 04 AD 24 04 8D 24 04 1C
C270: 60 A9 30 8D 24 04 AD 23 31
C278: 04 C9 39 F0 0A EE 23 04 90
C280: AD 23 04 8D 23 04 60 A9 14
C288: 30 8D 25 04 8D 24 04 8D B2
C290: 23 04 60 A9 0E 8D 40 03 A0
C298: 20 11 C2 A9 FF 8D 0E D4 A6
C2A0: 8D 0F D4 A9 81 8D 12 D4 B1
C2A8: A9 20 8D FF 03 A0 00 AD 51
C2B0: 42 03 85 FB A9 04 85 FC A7
C2B8: A2 03 A5 FB 6D 1B D4 85 E2
C2C0: FB A5 FC 69 00 85 FC 18 63
C2C8: CA D0 EF AD 43 03 91 FB D5
C2D0: CE FF 03 AD FF 03 D0 D7 FB
C2D8: 60 A9 EB 8D 42 03 A9 24 6F
C2E0: 8D 43 03 20 93 C2 A0 00 CB
C2E8: A9 20 99 A0 04 C8 C0 78 F2
C2F0: D0 F8 60 A9 A0 8D 42 03 38
C2F8: A9 24 8D 43 03 20 93 C2 11
C300: A0 00 A9 20 99 70 07 C8 44
C308: C0 79 D0 F8 60 A9 00 8D A3
C310: 04 D4 A9 2D 8D 01 D4 A9 CC
C318: C6 8D 00 D4 A9 80 8D 05 FD
C320: D4 A9 80 8D 06 D4 A9 21 52
C328: 8D 04 D4 A0 FF A2 FF 8C 5E
C330: 01 D4 8C 27 D0 CA D0 F7 1E
C338: 88 D0 F2 A9 00 8D 04 D4 94
C340: 60 20 3A C2 A9 02 8D 40 37
C348: 03 20 11 C2 A9 00 8D 21 97
C350: D0 A0 00 B9 C3 C1 99 0E A8
C358: 06 C8 C0 1D D0 F5 AD 00 79
C360: DC 29 1F C9 0F D0 F7 A9 D0
C368: 01 8D 41 03 A9 00 8D 48 BA
C370: 03 A9 01 8D 45 03 A9 32 CF
C378: 8D 47 03 A9 01 8D FA 03 86
C380: AD 0E DC 29 FE 8D 0E DC B9
C388: A5 01 29 FB 85 01 A0 00 7B
C390: B9 00 D0 99 00 30 C8 D0 7E
C398: F7 A0 00 B9 FE D0 99 FE 53
C3A0: 30 C8 D0 F7 A5 01 09 04 16
C3A8: 85 01 AD 0E DC 09 01 8D 5F
C3B0: 0E DC A9 1C 8D 18 D0 A0 78
C3B8: 00 B9 9D C1 99 10 31 C8 75
C3C0: C0 49 D0 F5 20 3A C2 A0 4F
C3C8: 00 A9 25 99 78 04 A9 07 5E
C3D0: 99 78 D8 C8 C0 28 D0 F1 30
C3D8: A9 30 8D 23 04 8D 25 04 1E
C3E0: 8D 24 04 A9 33 8D 02 04 07
C3E8: A0 00 B9 BD C1 99 61 04 C1
C3F0: C8 C0 06 D0 F5 A9 01 A0 92
C3F8: 00 99 00 D8 C8 C0 53 D0 19
C400: F8 A9 00 8D 21 D0 A9 07 D2
C408: 8D 20 D0 A9 0F 8D 18 D4 B9
C410: 20 D8 CA AD 41 03 8D 49 9C
C418: 03 A9 B0 8D 00 D0 A9 00 7D
C420: 8D 10 D0 A9 01 8D 15 D0 AC
C428: 20 E9 C1 A9 03 8D 40 03 71
C430: 20 11 C2 AD FA 03 D0 0B AB
C438: 20 F3 C2 A9 DF 8D 01 D0 F7
C440: 4C 4B C4 20 D9 C2 A9 46 49
C448: 8D 01 D0 A9 30 8D F8 07 0F
C450: A9 08 8D 27 D0 AD FA 03 33
C458: D0 0D A9 DF 8D 01 D0 A9 C8
C460: 01 8D 15 D0 4C 6C C4 A9 FB
C468: 01 8D 15 D0 AD 1F D0 A9 24
C470: 00 8D 0B D4 18 AD 00 DC 80
C478: 29 1F C9 0F D0 03 4C FE B8
C480: C4 18 A9 00 8D 0B D4 AD 22
C488: 00 DC 29 1F C9 17 D0 03 62
C490: 4C 06 C5 C9 1B D0 03 4C AD
C498: 60 C5 AD 48 03 F0 D0 20 99
C4A0: A8 CA AC 47 03 A2 64 CA DC
C4A8: D0 FD 88 D0 F8 AD FA 03 75
C4B0: D0 0B CE 01 D0 AD 01 D0 AC
C4B8: C9 46 4C C5 C4 EE 01 D0 60
C4C0: AD 01 D0 C9 DF D0 13 CE 9C
C4C8: 49 03 AD 49 03 D0 03 4C 2F
C4D0: 92 C5 A9 01 8D 48 03 4C F8
C4D8: 19 C4 AD 1F D0 29 01 C9 48
C4E0: 01 D0 18 20 0D C3 AD 02 6B
C4E8: 04 C9 30 F0 0B CE 02 04 B7
C4F0: A9 00 8D 48 03 4C 19 C4 9D
C4F8: 4C 70 CA 4C 81 C4 A9 01 BD
C500: 8D 48 03 4C 9A C4 AD 00 32
C508: D0 C9 40 D0 0A AD 10 D0 4C
C510: C9 01 D0 03 4C 93 C4 20 73
C518: 90 CA AD 47 03 E9 14 A8 12
C520: A2 64 CA D0 FD 88 D0 F8 13
C528: EE 00 D0 AD 00 D0 D0 05 3C
C530: A9 01 8D 10 D0 AD 1F D0 E6
C538: 18 29 01 8D 4A 03 AD 4A 4D
C540: 03 C9 01 D0 18 20 0D C3 E7
C548: AD 02 04 C9 30 F0 0B CE C0
C550: 02 04 A9 00 8D 48 03 4C 25
C558: 19 C4 4C 70 CA 4C 9A C4 69
C560: AD 00 D0 C9 18 D0 08 AD 47
C568: 10 D0 D0 03 4C 93 C4 20 E1
C570: 90 CA AD 47 03 E9 14 A8 6A
C578: A2 64 CA D0 FD 88 D0 F8 6B
```

```
C580: CE 00 D0 AD 00 D0 C9 FF 68
C588: D0 05 A9 00 8D 10 D0 4C C2
C590: 35 C5 20 D8 CA AD FA 03 FA
C598: D0 03 4C F2 C8 A9 00 8D AB
C5A0: EB 03 A9 00 8D ED 03 A9 61
C5A8: 01 8D EE 03 20 E9 C1 A9 9E
C5B0: 34 8D FC 07 A9 01 8D 2B D9
C5B8: D0 A9 E5 8D 09 D0 A9 96 C0
C5C0: 8D 08 D0 A9 08 8D 27 D0 5E
C5C8: A9 B0 8D 00 D0 A9 67 8D 20
C5D0: 01 D0 A9 31 8D F9 07 A9 B5
C5D8: 0D 8D 28 D0 A9 40 8D 02 E5
C5E0: D0 A9 02 8D 10 D0 A9 95 0B
C5E8: 8D 03 D0 A9 03 8D 29 D0 7E
C5F0: A9 32 8D FA 07 A9 0E 8D A1
C5F8: 2A D0 A9 35 8D FB 07 A9 0D
C600: 13 8D 15 D0 A9 00 8D 05 C2
C608: D4 8D 06 D4 8D 0C D4 8D 41
C610: 0D D4 AD 1E D0 A9 00 8D C5
C618: 4A 03 18 A9 00 8D 0B D4 94
C620: 8D 04 D4 AD 00 DC 29 1F 59
C628: C9 0F D0 45 AD ED 03 D0 86
C630: 3D AD EE 03 F0 38 A9 01 E0
C638: 8D ED 03 AD 00 D0 8D 06 C8
C640: D0 AD 10 D0 29 01 C9 01 94
C648: D0 0B AD 10 D0 09 08 8D 51
C650: 10 D0 4C 5D C6 AD 10 D0 30
C658: 29 F7 8D 10 D0 AD 01 D0 67
C660: 69 0E 8D 07 D0 18 AD 15 18
C668: D0 09 08 8D 15 D0 4C 00 0A
C670: C7 C9 17 D0 33 AD 00 D0 9B
C678: C9 22 D0 0A AD 10 D0 29 F6
C680: 01 F0 03 4C 00 C7 A9 50 83
C688: 8D 08 D4 A9 73 8D 07 D4 79
C690: A9 21 8D 0B D4 EE 00 D0 88
C698: AD 00 D0 D0 08 AD 10 D0 7E
C6A0: 09 01 8D 10 D0 4C 00 C7 2D
C6A8: C9 1B D0 29 AD 00 D0 C9 CF
C6B0: 18 D0 0A AD 10 D0 29 01 5C
C6B8: D0 03 4C 00 C7 20 90 CA 1C
C6C0: CE 00 D0 AD 00 D0 C9 FF A8
C6C8: D0 08 AD 10 D0 29 FE 8D E5
C6D0: 10 D0 4C 00 C7 C9 1E D0 7E
C6D8: 13 AD 01 D0 C9 46 D0 03 4F
C6E0: 4C 00 C7 20 A8 CA CE 01 58
C6E8: D0 4C 00 C7 C9 1D F0 03 A8
C6F0: 4C 00 C7 AD 01 D0 C9 68 B6
C6F8: F0 F6 20 A8 CA EE 01 D0 35
C700: AD EE 03 D0 10 AD 09 D0 08
C708: C9 46 D0 03 4C 7D C8 CE 4D
C710: 09 D0 4C A5 C7 AD 1B D4 41
C718: 29 31 F0 08 AD 61 03 D0 4E
C720: 43 4C 39 C7 AD 61 03 F0 B3
C728: 08 A9 00 8D 61 03 4C 1C 34
C730: C7 A9 01 8D 61 03 4C 1C FC
C738: C7 AD 08 D0 C9 18 D0 0F 48
C740: AD 10 D0 29 10 C9 10 F0 D2
C748: 06 EE 08 D0 4C 61 C7 CE 5A
C750: 08 D0 AD 08 D0 C9 FF D0 4A
C758: 08 AD 10 D0 29 EF 8D 10 A5
C760: D0 4C 8A C7 AD 08 D0 C9 20
C768: 40 D0 0F AD 10 D0 29 10 50
C770: C9 10 D0 06 CE 08 D0 4C 15
C778: 8A C7 EE 08 D0 AD 08 D0 19
C780: D0 08 AD 10 D0 09 10 8D 8E
C788: 10 D0 AD 1B D4 29 15 D0 16
C790: 14 AD FC 07 C9 34 D0 08 2D
C798: A9 33 8D FC 07 4C A5 C7 C0
C7A0: A9 34 8D FC 07 AD EC 03 AD
C7A8: D0 15 AD 03 D0 C9 47 D0 F1
C7B0: 08 A9 01 8D EC 03 4C D1 FE
C7B8: C7 CE 03 D0 4C D1 C7 AD B6
C7C0: 03 D0 C9 AD D0 08 A9 00 8E
C7C8: 8D EC 03 4C D1 C7 EE 03 1E
C7D0: D0 20 D7 C7 4C 3D C8 AD 61
C7D8: EB 03 D0 2D AD 1B D4 29 8C
C7E0: 07 F0 03 4C 3C C8 AD 10 EA
C7E8: D0 09 04 8D 10 D0 A9 01 DF
C7F0: 8D EB 03 A9 31 8D 04 D0 AA
C7F8: AD 03 D0 8D 05 D0 AD 15 A0
C800: D0 09 04 8D 15 D0 4C 3C D9
C808: C8 AD 04 D0 C9 10 D0 17 15
C810: AD 10 D0 29 04 D0 10 A9 56
C818: 00 8D EB 03 AD 15 D0 29 51
C820: FB 8D 15 D0 4C 3C C8 CE AF
C828: 04 D0 20 C0 CA AD 04 D0 2B
C830: C9 FF D0 08 AD 10 D0 29 8A
C838: FB 8D 10 D0 60 AD ED 03 A1
C840: F0 1A AD 07 D0 C9 EE F0 7A
C848: 06 EE 07 D0 4C 5C C8 AD 34
C850: 15 D0 29 F7 8D 15 D0 A9 74
C858: 00 8D ED 03 AC 47 03 A2 70
C860: 50 CA D0 FD C0 10 D0 03 EE
C868: 20 D7 C7 88 D0 F1 AD 1E 3F
C870: D0 8D 4A 03 AD 4A 03 29 40
C878: 04 C9 04 D0 13 20 0D C3 1F
C880: AD 02 04 C9 30 F0 06 CE F3
C888: 02 04 4C 92 C5 4C 70 CA BA
C890: AD EE 03 D0 41 AD 4A 03 3D
C898: 29 01 C9 01 D0 38 A0 FF 37
C8A0: A2 FF 8E 01 D4 8C 00 D4 09
C8A8: A9 21 8D 04 D4 8E 20 D0 59
C8B0: A9 00 8D 04 D4 CA D0 EA 47
C8B8: 88 D0 E5 20 4A C2 A9 07 D5
C8C0: 8D 20 D0 AD FA 03 F0 2A 06
C8C8: A9 00 8D FA 03 8D 48 03 D6
C8D0: 8D 10 D0 4C 01 C4 AD 4A 49
C8D8: 03 29 18 C9 18 D0 10 AD 8D
C8E0: 15 D0 29 F7 8D 15 D0 A9 05
C8E8: 00 8D EE 03 8D ED 03 4C 33
C8F0: 12 C6 20 D8 CA A9 01 8D C5
C8F8: 15 D0 AD 47 03 8D 8B 03 F2
C900: A9 08 8D 77 03 20 E9 C1 85
C908: A9 08 8D 27 D0 A9 FC 8D 73
C910: 00 D0 A9 00 8D 10 D0 A9 A2
C918: 7F 8D 01 D0 A9 0B 8D 40 79
```

```
C920: 03 20 11 C2 A9 10 8D FF 5E
C928: 03 A9 A0 8D 42 03 A9 22 14
C930: 8D 43 03 20 AD C2 A9 EC 2B
C938: 8D 42 03 A9 10 8D FF 03 55
C940: 20 AD C2 A9 20 8D D4 05 02
C948: 8D D5 05 8D D6 05 8D D7 7F
C950: 05 8D FC 05 8D FD 05 8D 03
C958: FE 05 8D FF 05 AD 1F D0 8C
C960: A9 00 8D 0B D4 8D 04 D4 DD
C968: 20 C0 CA 18 AD 00 DC 29 DF
C970: 1F C9 1E D0 10 AD 01 D0 D7
C978: C9 5E F0 06 CE 01 D0 20 58
C980: A8 CA 4C 96 C9 C9 1D D0 58
C988: F9 AD 01 D0 C9 D2 F0 F2 82
C990: EE 01 D0 20 A8 CA AD 1F B1
C998: D0 29 01 C9 01 D0 1B A9 F3
C9A0: 0B 8D 40 03 20 11 C2 20 90
C9A8: 0D C3 AD 02 04 C9 30 F0 18
C9B0: 06 CE 02 04 4C F5 C8 4C E2
C9B8: 70 CA A9 00 8D 40 03 20 8E
C9C0: 11 C2 CE 77 03 AD 77 03 06
C9C8: F0 0E AC 47 03 A2 AA CA D6
C9D0: D0 FD 88 D0 F8 4C 60 C9 68
C9D8: A9 08 8D 77 03 AD E8 07 30
C9E0: 8D 79 03 A9 E7 85 FB A9 A7
C9E8: 07 85 FC A0 00 B1 FB 8D 4E
C9F0: 7A 03 18 A5 FB 69 01 85 18
C9F8: FB A5 FC 69 00 85 FC AD 31
CA00: 7A 03 91 FB 38 A5 FB E9 CE
CA08: 02 85 FB A5 FC E9 00 85 9D
CA10: FC A5 FB C9 9F D0 D6 A5 65
CA18: FC C9 04 D0 D0 AD 79 03 AE
CA20: 8D A0 04 AD 1B D4 29 01 1A
CA28: F0 03 4C 60 C9 A9 0B 8D D4
CA30: 40 03 20 11 C2 EE 8B 03 E4
CA38: AD 8B 03 C9 40 F0 03 4C BE
CA40: 60 C9 4C 11 CB AD 47 03 8B
CA48: C9 19 F0 03 CE 47 03 AD E5
CA50: 41 03 C9 14 F0 03 EE 41 96
CA58: 03 A9 01 8D FA 03 A9 00 3B
CA60: 8D 48 03 AD 02 04 C9 33 E9
CA68: F0 03 EE 02 04 4C 10 C4 72
CA70: 20 E9 C1 A9 00 8D 15 D0 59
CA78: A9 03 8D 40 03 20 11 C2 E9
CA80: A0 00 B9 E0 C1 99 C7 05 E3
CA88: C8 C0 09 D0 F5 4C 51 C3 43
CA90: A9 50 8D 08 D4 A9 73 8D 9F
CA98: 07 D4 A9 00 8D 0C D4 8D 1A
CAA0: 00 D4 A9 21 8D 0B D4 60 0E
CAA8: A9 36 8D 08 D4 A9 6F 8D 99
CAB0: 07 D4 A9 00 8D 0C D4 8D 32
CAB8: 0D D4 A9 11 8D 0B D4 60 23
CAC0: A9 10 8D 01 D4 A9 6F 8D 84
CAC8: 00 D4 A9 00 8D 05 D4 8D 3C
CAD0: 06 D4 A9 21 8D 04 D4 60 3D
CAD8: AD 15 D0 8D 61 03 A9 00 08
CAE0: 8D 15 D0 A0 FF A2 64 CA C6
CAE8: AD 1E D0 AD 1F D0 20 A8 EB
CAF0: CA E0 00 D0 F2 A9 00 8D 97
CAF8: 0B D4 20 90 CA 8C 21 D0 D2
CB00: 88 C0 00 D0 E0 A9 00 8D 32
CB08: 21 D0 AD 61 03 8D 15 D0 7F
CB10: 60 AD 41 03 8D 49 03 20 5C
CB18: D8 CA A9 01 8D 7E 03 20 95
CB20: E9 C1 A9 01 8D 40 03 20 67
CB28: 11 C2 A9 08 8D 27 D0 A9 DC
CB30: 01 8D 10 D0 A9 7F 8D 01 57
CB38: D0 A9 40 8D 00 D0 A9 01 FB
CB40: 8D 15 D0 A9 AA 85 FB A9 33
CB48: 04 85 FC A0 00 A2 0A 18 34
CB50: A9 25 91 FB A5 FB 69 28 DF
CB58: 85 FB A5 FC 69 00 85 FC 68
CB60: CA D0 EC AD 1F D0 AD 7E B2
CB68: 03 F0 0E AD 00 DC 29 1F 3D
CB70: C9 0F D0 74 A9 00 8D 7E 44
CB78: 03 AD 00 DC 29 1F C9 1E 36
CB80: D0 0D AD 01 D0 C9 46 F0 DE
CB88: 17 CE 01 D0 20 A8 CA C9 9D
CB90: 1D D0 0D AD 01 D0 C9 E2 B7
CB98: F0 06 EE 01 D0 20 A8 CA E3
CBA0: AD 10 D0 D0 15 AD 00 D0 93
CBA8: C9 18 D0 0E CE 49 03 AD 32
CBB0: 49 03 F0 03 4C 1F CB 4C 74
CBB8: 45 CA CE 00 D0 20 90 CA E3
CBC0: AD 00 D0 C9 FF D0 05 A9 88
CBC8: 00 8D 10 D0 AD 1F D0 29 FD
CBD0: 01 C9 01 D0 13 20 0D C3 71
CBD8: AD 02 04 C9 30 F0 06 CE 4C
CBE0: 02 04 4C 17 CB 4C 70 CA 9D
CBE8: AC 47 03 A2 50 CA D0 FD 6C
CBF0: 88 D0 F8 A9 00 8D 04 D4 53
CBF8: 8D 0B D4 AD 1B D4 29 03 30
CC00: F0 03 4C 66 CB AD AA 04 CE
CC08: 8D 5C 03 A9 D2 85 FB A9 9C
CC10: 04 85 FC A0 00 B1 FB 8D 72
CC18: 5D 03 38 A5 FB E9 28 85 E9
CC20: FB A5 FC E9 00 85 FC AD D8
CC28: 5D 03 91 FB 18 A5 FB 69 39
CC30: 50 85 FB A5 FC 69 00 85 93
CC38: FC A5 FB C9 F2 D0 D6 A5 E0
CC40: FC C9 07 D0 D0 AD 5C 03 BC
CC48: 8D CA 07 4C 66 CB 00 00 26
```

# 128 RAM CHECK
## FROM PAGE 39

```
·10 REM *** 128 RAM CHECK *** BUCK CHILDR
ESS ***                                  OI
·20 REM *** P.O. BOX 13575 SALEM, OR 9730
```

```
9 ***                                         DC
·30 PRINTCHR$(147)"LOADING AND CHECKING D
ATA LINE:":J=4864:L=90                        OG
·40 PRINTCHR$(19)TAB(31)L:PRINT:FORB=0TO1
1:READA:IFA<0ORA>255THEN80                    MB
·50 POKEJ+B,A:X=X+A:NEXTB:READA:IFA<>XTHE
N80                                           JF
·60 X=0:J=J+12:L=L+10:IFL<461THEN40           AN
·70 PRINT"THE DATA IS OK AND LOADED.":PRI
NT:PRINT"SYS 4864 TO ACTIVATE.":END           PL
·80 PRINT"ERROR IN DATA LINE:"L:END           HL
·90 DATA169,0,162,11,160,16,141,0,255,133
,250,133,1430                                 NO
·100 DATA254,134,251,132,252,32,125,255,1
47,0,162,5,1749                               NK
·110 DATA160,13,24,32,240,255,32,125,255,
42,42,32,1252                                 JN
·120 DATA66,65,78,75,32,48,32,42,42,13,17
,67,577                                       OC
·130 DATA72,69,67,75,73,78,71,32,67,65,83
,83,835                                       KL
·140 DATA69,84,84,69,32,66,85,70,70,69,82
,44,824                                       KH
·150 DATA13,73,78,80,85,84,47,79,85,84,80
,85,873                                       MH
·160 DATA84,32,66,85,70,70,69,82,83,44,32
,65,782                                       FP
·170 DATA78,68,13,83,80,82,73,84,69,32,68
,69,799                                       OM
·180 DATA70,73,78,73,84,73,79,78,32,65,82
,69,856                                       JL
·190 DATA65,32,32,0,56,32,240,255,134,65,
132,66,1109                                   OF
·200 DATA160,0,132,253,169,63,141,0,255,1
64,253,152,1742                               MF
·210 DATA141,99,4,166,254,240,29,162,250,
142,185,2,1674                                IC
·220 DATA142,200,2,160,0,140,0,255,162,1,
32,119,1213                                   KM
·230 DATA255,162,1,32,122,255,240,12,208,
87,144,200,1718                               PA
·240 DATA162,0,129,250,193,250,208,77,168
,200,132,253,2022                             BE
·250 DATA208,198,140,0,255,166,65,164,66,
24,32,240,1558                                KC
·260 DATA255,32,125,255,18,0,165,251,166,
250,32,50,1599                                HO
·270 DATA142,230,250,208,171,230,251,165,
251,197,252,144,2491                          JP
·280 DATA163,166,65,164,66,24,32,240,255,
32,125,255,1587                               KC
·290 DATA42,42,42,32,79,75,32,42,42,42,13
,0,483                                        ON
·300 DATA165,252,201,255,144,58,165,254,2
40,58,96,144,2032                             FO
·310 DATA169,169,0,141,0,255,166,65,164,6
6,24,32,1251                                  AG
·320 DATA240,255,32,125,255,42,32,69,82,8
2,79,82,1375                                  CK
·330 DATA32,0,165,251,166,250,32,50,142,3
2,125,255,1500                                FN
·340 DATA32,42,13,0,165,254,208,210,133,2
50,165,252,1724                               BC
·350 DATA201,208,176,4,144,72,144,199,32,
125,255,17,1577                               HK
·360 DATA17,29,29,29,29,29,29,29,29,29,29
,29,336                                       AL
·370 DATA29,29,42,42,32,66,65,78,75,32,49
,32,571                                       CH
·380 DATA42,42,13,0,162,4,134,254,160,255
,134,251,1451                                 PH
·390 DATA132,252,32,125,255,17,67,72,69,6
7,75,73,1236                                  LB
·400 DATA78,71,32,66,65,83,73,67,32,82,65
,77,791                                       CE
·410 DATA32,32,0,24,144,184,165,252,162,2
8,201,28,1252                                 EC
·420 DATA176,214,169,19,133,251,134,252,3
2,125,255,17,1777                             ON
·430 DATA67,72,69,67,75,73,78,71,32,70,82
,69,825                                       OL
·440 DATA69,32,82,65,77,32,32,0,162,0,189
,124,864                                      MI
·450 DATA19,157,0,14,189,124,20,157,0,15,
232,208,1135                                  MA
·460 DATA241,76,0,14,0,0,0,0,0,0,0,0,331      DC
```

# GUARDIAN
## FROM PAGE 74

**Starting address in hex: C000**
**Ending address in hex: CFFA**
**SYS to start: 49152**

***Flankspeed* required for entry! See page 121.**

```
C000: A9 00 8D D8 02 8D D9 02 7B
C008: A9 03 8D D6 02 A9 0B 8D 5D
C010: 22 D0 A9 0C 8D 23 D0 A9 E3
C018: 0F 8D 24 D0 A9 05 8D D5 BB
C020: 02 78 A5 01 29 FB 85 01 EC
C028: A9 00 85 FB 85 FD A9 D0 51
C030: 85 FC A9 38 85 FE A2 08 C3
C038: A0 00 B1 FB 91 FD 88 D0 6F
C040: F9 E6 FC E6 FE CA D0 F0 90
C048: A5 01 09 04 85 01 58 20 FA
C050: CE C6 20 73 C7 20 81 C9 AC
C058: 20 4D CB AD 18 D0 09 0E 3F
C060: 8D 18 D0 A9 FF 8D 0F D4 F1
C068: A9 80 8D 12 D4 20 5A CA 4C
C070: A9 92 20 D2 FF A2 00 A0 E2
C078: 07 8C 86 02 18 20 F0 FF BD
C080: AD D9 02 AE D8 02 20 CD 81
C088: BD A9 30 20 D2 FF AD D6 97
C090: 02 38 C9 03 B0 0F 48 A2 42
C098: 00 A0 25 18 20 F0 FF A9 31
C0A0: 20 20 D2 FF 68 38 C9 02 20
```

```
C0A8: B0 0F 48 A2 00 A0 24 18 30
C0B0: 20 F0 FF A9 20 20 D2 FF 7E
C0B8: 68 38 C9 01 B0 0D A2 00 84
C0C0: A0 23 18 20 F0 FF A9 20 77
C0C8: 20 D2 FF AD 11 D0 10 FB 57
C0D0: AD 1E D0 29 3F 8D C8 02 2E
C0D8: 20 3D C2 CE C3 02 D0 09 67
C0E0: 20 3F C3 AD D5 02 8D C3 DA
C0E8: 02 AD B9 02 D0 77 A9 0A 50
C0F0: CD BB 02 D0 32 A9 04 8D BA
C0F8: 2D D0 A9 DD 8D FE 07 A9 BB
C100: E6 85 A2 A5 A2 D0 FC A2 C7
C108: 07 20 7F C5 A9 80 0D 15 C0
C110: D0 8D 15 D0 20 7F C5 A2 5C
C118: 07 20 7F C5 A9 00 8D 15 D0
C120: D0 20 48 C6 4C 00 C0 AE DB
C128: BA 02 A0 10 18 20 F0 FF BE
C130: A0 FF C8 98 48 0A AA E8 18
C138: BD B9 C8 A8 CA BD B9 C8 2C
C140: 20 1E AB A9 58 A0 C8 20 B5
C148: 1E AB 68 A8 CC BB 02 D0 7E
C150: E1 A9 10 8D B9 02 A9 09 E7
C158: CD BB 02 D0 08 A9 C0 0D 34
C160: 1B D0 8D 1B D0 AD C8 02 3E
C168: C9 09 F0 08 C9 0D F0 04 FF
C170: C9 39 D0 1D AD C5 02 C9 A0
C178: 05 D0 16 A2 00 20 7F C5 6C
C180: CE D6 02 D0 06 20 57 C6 3D
C188: 4C 00 C0 20 8F CA 4C 70 CC
C190: C0 AD C8 02 C9 05 D0 03 6C
C198: 4C 7B C1 AD C8 02 C9 2B 8F
C1A0: F0 08 C9 0A F0 04 C9 3B 67
C1A8: D0 5C AD C1 02 30 57 AD 7C
C1B0: 01 D0 38 E9 AA 8D CB 02 AA
C1B8: AD C7 02 38 CD CB 02 B0 B4
C1C0: 45 AD C7 02 18 69 0F 38 46
C1C8: CD CB 02 90 39 A9 FD 2D 03
C1D0: 15 D0 8D 15 D0 A2 03 20 EF
C1D8: 7F C5 A9 D3 2D 15 D0 8D 3C
C1E0: 15 D0 A9 00 8D AE 02 20 CE
C1E8: D4 CA AC C2 02 C8 A9 32 9E
C1F0: A2 00 18 6D D8 02 8D D8 5A
C1F8: 02 8A 6D D9 02 8D D9 02 38
C200: 88 D0 EB 4C 70 C0 AD BB 2C
C208: 02 C9 09 D0 2D AD 02 D0 5B
C210: 38 C9 A6 90 25 38 C9 B2 23
C218: B0 20 AD 03 D0 38 C9 82 EE
C220: 90 18 38 C9 8A B0 13 A9 C2
C228: 02 0D 1D D0 8D 1D D0 A2 43
C230: 01 20 7F C5 20 12 C6 4C DB
C238: 21 C0 4C CB C0 AD 00 DC 7D
C240: AA 29 10 D0 59 AD AE 02 AC
C248: D0 54 A9 01 8D AE 02 AD 04
C250: 00 D0 18 69 0C 8D 02 D0 0F
C258: AD 01 D0 38 E9 0F 8D 03 99
C260: D0 A9 02 0D 17 D0 8D 17 76
C268: D0 A9 02 0D 15 D0 8D 15 7A
C270: D0 A9 02 8D B2 02 A9 02 DA
C278: 8D B1 02 AD 00 D0 38 C9 3A
C280: 7A 90 0A 38 C9 CC B0 0A 1F
C288: A9 00 4C 97 C2 A9 01 4C CF
C290: 97 C2 A9 FF 4C 97 C2 8D C8
C298: B3 02 8A 09 10 AA 8A C9 F0
C2A0: 7B D0 10 AD 00 D0 C9 50 95
C2A8: F0 06 CE 00 D0 CE 08 D0 E6
C2B0: 4C E6 C2 C9 77 D0 10 AD 76
C2B8: 00 D0 C9 FA F0 06 EE 00 34
C2C0: D0 EE 08 D0 4C E6 C2 C9 19
C2C8: 7E D0 0D AD 01 D0 C9 D7 46
C2D0: F0 03 EE 01 D0 4C E6 C2 7B
C2D8: C9 7D D0 0A AD 01 D0 C9 44
C2E0: AA F0 03 CE 01 D0 AD AE 7C
C2E8: 02 F0 03 20 EF C2 60 CE E0
C2F0: B1 02 D0 4A A9 02 8D B1 AA
C2F8: 02 AD 03 D0 48 38 C9 8C 53
C300: B0 0D A9 FD 2D 17 D0 8D 08
C308: 17 D0 A9 01 8D B2 02 68 45
C310: 38 ED B2 02 8D 03 D0 38 84
C318: C9 64 90 0D AD 02 D0 18 7C
C320: 6D B3 02 8D 02 D0 38 B0 8C
C328: 15 A9 FD 2D 15 D0 8D 15 9A
C330: D0 A9 00 8D AE 02 A9 FD 90
C338: 2D 10 D0 8D 10 D0 60 AD C2
C340: 15 D0 29 28 F0 03 4C BF 77
C348: C3 A9 08 0D 1B D0 8D 1B 5F
C350: D0 A9 0A 8D C4 02 A9 00 D2
C358: 8D 2A D0 8D C5 02 8D C6 8A
C360: 02 A9 DE 8D FB 07 AD 1B 44
C368: D4 29 03 AA BD D9 C8 8D 02
C370: FD 07 8E C2 02 BD D5 C8 25
C378: 8D 2C D0 A9 FF 8D C1 02 FD
C380: A9 8A 8D 07 D0 8D 0B D0 83
C388: A9 A0 8D 06 D0 A9 AB 8D 1A
C390: 0A D0 A9 DF 2D 17 D0 8D 97
C398: 17 D0 A9 DF 2D 1D D0 8D B2
C3A0: 1D D0 A9 08 0D 17 D0 8D C2
C3A8: 17 D0 A9 08 0D 1D D0 8D CA
C3B0: 1D D0 A9 00 8D C0 02 A9 42
C3B8: 28 0D 15 D0 8D 15 D0 A2 E9
C3C0: 06 A0 0A AD C1 02 10 06 F8
C3C8: 98 48 8A A8 68 AA BD 00 AD
C3D0: D0 18 6D C0 02 9D 00 D0 58
C3D8: E8 BD 00 D0 18 6D C1 02 99
C3E0: 9D 00 D0 AD C1 02 10 03 D3
C3E8: 4C A8 C4 B9 00 D0 18 6D B2
C3F0: C0 02 99 00 D0 C8 B9 00 A0
C3F8: D0 18 6D C1 02 99 00 D0 7D
C400: CE C4 02 F0 03 4C 1D C5 B8
C408: A9 14 8D C4 02 AE C5 02 90
C410: E0 05 F0 F1 EE C5 02 AD 3D
C418: C5 02 0A 0A 18 6D C5 02 41
C420: AA AD C6 02 D0 27 BD DD D4
C428: C8 8D C6 02 F0 1F AD 06 0B
C430: D0 18 69 09 8D 04 D0 AD 9B
C438: 07 D0 18 69 0B 8D 05 D0 FF
C440: A9 00 8D 29 D0 A9 04 0D 2C
```

```
C448: 15 D0 8D 15 D0 E8 A9 D7 0C
C450: 2D 1D D0 1D DD C8 8D 1D D9
C458: D0 A9 D7 2D 17 D0 1D DD BA
C460: C8 8D 17 D0 E8 BD DD C8 EB
C468: 18 6D 06 D0 8D 06 D0 BD E6
C470: DD C8 18 6D 07 D0 8D 07 09
C478: D0 BD DD C8 18 6D 0A D0 0E
C480: 8D 0A D0 BD DD C8 18 6D D2
C488: 0B D0 8D 0B D0 E8 AC C2 26
C490: 02 B9 D9 C8 18 7D DD C8 2B
C498: 8D FB 07 E8 A9 DB 18 7D 2D
C4A0: DD C8 8D FD 07 4C 1D C5 09
C4A8: AD 0B D0 38 C9 78 B0 6D CA
C4B0: A9 D7 2D 17 D0 8D 17 D0 BC
C4B8: A9 D7 2D 1D D0 8D 1D D0 D0
C4C0: A9 01 8D C1 02 AE C2 02 30
C4C8: BD D5 C8 8D 2A D0 A9 00 57
C4D0: 8D 2C D0 AE 0A D0 8E 06 79
C4D8: D0 AD C2 02 C9 02 F0 1C F4
C4E0: C9 03 F0 18 AD 1B D4 29 7D
C4E8: 1F 8D C7 02 AD 0B D0 38 21
C4F0: E9 1F 18 6D C7 02 8D 07 DD
C4F8: D0 4C 0A C5 AD 0B D0 38 A7
C500: E9 05 8D 07 D0 A9 05 8D 90
C508: C7 02 AD FD 07 8D FB 07 15
C510: A9 DB 8D FD 07 A9 F7 2D F6
C518: 1B D0 8D 1B D0 AD C5 02 F2
C520: 38 C9 01 90 20 AD 06 D0 58
C528: 38 CD 00 D0 F0 12 90 08 9A
C530: A9 FF 8D C0 02 4C 45 C5 81
C538: A9 01 8D C0 02 4C 45 C5 8A
C540: A9 00 8D C0 02 AD 0B D0 C3
C548: C9 08 D0 08 A9 D7 2D 15 B6
C550: D0 8D 15 D0 AD C6 02 F0 FB
C558: 25 EE 05 D0 EE 05 D0 AD B4
C560: 04 D0 18 6D C0 02 8D 04 0F
C568: D0 AD 05 D0 8D 29 D0 30 74
C570: 0D A9 FB 2D 15 D0 8D 15 D8
C578: D0 A9 00 8D C6 02 60 A9 53
C580: 80 8D 0B D4 A9 D8 9D F8 87
C588: 07 BD B8 C7 0D 1C D0 8D 55
C590: 1C D0 A9 0F 8D 08 D4 A9 4A
C598: 0F 8D 07 D4 A9 F0 8D 0D 46
C5A0: D4 A9 00 8D 0C D4 A9 81 B8
C5A8: 8D 0B D4 A9 0F 8D A7 02 06
C5B0: 8E A8 02 20 97 E0 A5 8E B6
C5B8: AE A8 02 9D 27 D0 A9 FF 51
C5C0: 85 A2 A5 A2 D0 FC BD 27 E3
C5C8: D0 8D 26 D0 A9 FE 85 A2 EE
C5D0: A5 A2 D0 FC BD 27 D0 8D 2A
C5D8: 25 D0 A9 FD 85 A2 A5 A2 E6
C5E0: D0 FC AE A8 02 AC A7 02 5E
C5E8: 88 8C A7 02 8C 07 D4 8C 9C
C5F0: 0C D4 D0 BF A9 FF 38 FD 42
C5F8: B8 C7 2D 15 D0 8D 15 D0 FF
C600: A9 80 8D 0B D4 A9 FF 38 79
C608: FD B8 C7 2D 1C D0 8D 1C 4A
C610: D0 60 A9 01 8D B5 02 8D BE
C618: AF 02 8D 15 D0 A2 03 A0 83
C620: 05 18 20 F0 FF A9 11 A0 A9
C628: C8 20 1E AB A9 32 85 A2 DE
C630: A5 A2 D0 FC EE 22 D0 EE 17
C638: 23 D0 EE 24 D0 AD D5 02 95
C640: C9 01 F0 03 CE D5 02 60 06
C648: A2 03 A0 05 18 20 F0 FF BC
C650: A9 EE A0 C7 20 1E AB A2 DD
C658: 05 A0 05 18 20 F0 FF A9 D5
C660: 34 A0 C8 20 1E AB AD 00 95
C668: DC C9 7F D0 F9 AD 00 DC E3
C670: C9 7F F0 F9 60 A2 18 A9 69
C678: 00 9D 00 D4 CA 10 FA A9 6A
C680: F0 8D 06 D4 A9 11 8D 04 26
C688: D4 A9 0F 8D 18 D4 60 AE 9F
C690: B5 02 BD 7F C9 8D B6 02 95
C698: 8A 0A AA BD 7B C9 85 02 62
C6A0: E8 BD 7B C9 85 03 CE AF 93
C6A8: 02 D0 22 A9 10 8D AF 02 96
C6B0: AC B0 02 38 CC B6 02 90 5E
C6B8: 05 A0 00 8E B0 02 B1 02 53
C6C0: 8D 01 D4 C8 B1 02 8D 00 2E
C6C8: D4 C8 8C B0 02 60 A9 F4 A4
C6D0: 8D 14 03 A9 C6 8D 15 03 8B
C6D8: A9 01 8D 12 D0 AD 11 D0 83
C6E0: 29 7F 8D 11 D0 A9 81 8D B1
C6E8: 1A D0 20 75 C6 A9 00 8D 67
C6F0: B9 02 58 60 AD 19 D0 8D 8A
C6F8: 19 D0 29 01 D0 07 AD 0D 9F
C700: DC 58 4C 31 EA AD 12 D0 2E
C708: 38 C9 3A B0 0A A9 02 8D 38
C710: 21 D0 A9 3A 4C 1E C7 A9 C1
C718: 00 8D 21 D0 A9 01 8D 12 E1
C720: D0 20 8F C6 CE AD 02 D0 B6
C728: 47 AD 22 D0 AC 23 D0 AE 5F
C730: 24 D0 8D 23 D0 8C 24 D0 28
C738: 8E 22 D0 A9 0C 8D AD 02 AC
C740: CE B4 02 D0 2B A9 0A 8D 03
C748: B4 02 EE 0E D0 AD 0C D0 57
C750: 38 E9 01 8D 0C D0 B0 08 96
C758: A9 BF 2D 10 D0 8D 10 D0 3E
C760: AD B9 02 F0 0B CE B9 02 50
C768: D0 06 CE BA 02 EE BB 02 77
C770: 4C BC FE A9 B9 85 FB A9 07
C778: CF 85 FC A0 00 B1 FB F0 0A
C780: 36 A2 00 18 0A 48 8A 2A 78
C788: AA 68 0A 48 8A 2A AA 68 B5
C790: 0A 48 8A 2A AA 68 85 FD 2E
C798: C6 FD 8A 18 69 38 85 FE 26
C7A0: A0 08 B1 FB 91 FD 88 D0 DF
C7A8: F9 A5 FB 18 69 09 85 FB 50
C7B0: 90 02 E6 FC 4C 7B C7 60 17
C7B8: 01 02 04 08 10 20 40 80 B8
C7C0: 8E 08 92 90 20 53 43 4F 80
C7C8: 52 45 3A 20 20 20 20 20 3B
C7D0: 20 20 20 12 20 47 55 41 41
C7D8: 52 44 49 41 4E 20 92 20 1B
C7E0: 20 20 20 53 48 49 50 53 C9
```

```
C7E8: 3A 2A 2A 2A 20 00 12 90 64
C7F0: 20 54 48 45 20 45 41 52 EB
C7F8: 54 48 20 48 41 53 20 42 F4
C800: 45 45 4E 20 44 45 53 54 2A
C808: 52 4F 59 45 44 20 21 20 ED
C810: 00 12 90 59 4F 55 20 48 19
C818: 41 56 45 20 53 41 56 45 45
C820: 44 20 54 48 45 20 50 4C 23
C828: 41 4E 45 54 20 45 41 52 4A
C830: 54 48 21 00 12 90 50 52 33
C838: 45 53 53 20 46 49 52 45 6B
C840: 20 42 55 54 54 4F 4E 20 5E
C848: 54 4F 20 50 4C 41 59 20 63
C850: 41 47 41 49 4E 21 92 00 65
C858: 11 9D 9D 9D 9D 9D 9D 9D B8
C860: 9D 9D 00 1E 92 20 20 20 AC
C868: 20 20 20 20 20 20 00 20 49
C870: 20 20 20 25 20 20 20 20 76
C878: 00 20 20 20 3C 23 3E 20 96
C880: 20 20 00 20 20 3C 23 23 83
C888: 23 3E 20 20 00 20 3C 23 A9
C890: 23 23 23 23 3E 20 00 3C B7
C898: 23 23 23 23 23 23 23 3E CC
C8A0: 00 23 23 23 23 23 23 23 96
C8A8: 23 23 00 23 23 23 23 12 8D
C8B0: 90 25 1E 92 23 23 23 23 A3
C8B8: 00 63 C8 6F C8 79 C8 83 E2
C8C0: C8 8D C8 97 C8 A1 C8 A1 4C
C8C8: C8 A1 C8 AB C8 CF D9 DF F9
C8D0: D0 DA DB D6 D7 01 03 0D 18
C8D8: 08 D0 D0 D3 D3 00 00 00 2A
C8E0: 00 00 00 00 00 01 00 01 E2
C8E8: 00 00 02 01 00 28 F4 01 0A
C8F0: 00 01 28 00 02 01 00 28 45
C8F8: 00 02 01 04 30 04 FB 04 34
C900: 30 04 FB 00 00 04 B4 00 E8
C908: 00 04 B4 00 00 04 B4 04 7D
C910: 70 04 FB 04 70 00 00 04 F8
C918: B4 00 00 04 30 04 B4 04 BD
C920: 70 04 FB 04 70 04 B4 04 C1
C928: B4 05 98 05 ED 05 98 00 0B
C930: 00 05 98 05 ED 00 00 04 C4
C938: 30 04 B4 04 30 04 70 04 CD
C940: FB 04 30 05 98 05 ED 00 01
C948: 00 05 ED 00 00 00 00 05 40
C950: ED 05 98 00 00 1C 31 1C 45
C958: 31 1C 31 1D DF 12 D1 13 CA
C960: EF 16 60 16 60 16 60 16 C9
C968: 60 1C 31 1C 31 1C 31 1D CD
C970: DF 12 D1 13 EF 16 60 16 C3
C978: 60 00 00 FB C8 55 C9 5A 17
C980: 26 AD 11 D0 29 EF 8D 11 ED
C988: D0 A9 90 20 D2 FF A9 93 C3
C990: 20 D2 FF A9 00 8C 21 D0 AB
C998: 8D 15 D0 8D 20 D0 AD 11 49
C9A0: D0 09 40 8D 11 D0 A9 0F E2
C9A8: 85 FD A9 19 85 FE A9 05 22
C9B0: 8D A7 02 A9 09 8D A9 02 D3
C9B8: A9 58 20 1C CA C6 FD E6 6D
C9C0: FE EE A9 02 A9 98 20 1C D8
C9C8: CA C6 FD E6 FE EE A9 02 D8
C9D0: A9 D8 20 1C CA C6 FD E6 06
C9D8: FE EE A9 02 CE A7 02 F0 DB
C9E0: 03 4C B8 C9 A2 00 A0 18 0E
C9E8: A9 98 20 EC CA A2 00 A0 46
C9F0: 00 18 20 F0 FF A9 C0 A0 25
C9F8: C7 20 1E AB A2 4B 8A 48 6B
CA00: 20 97 E0 A4 8E 68 AA A9 88
CA08: 2E 99 28 04 98 99 28 D8 2F
CA10: CA D0 EB AD 11 D0 09 10 40
CA18: 8D 11 D0 60 AC A9 02 A2 E2
CA20: 00 20 EC CA E8 E4 FD D0 94
CA28: F8 48 A9 04 8D A8 02 68 B7
CA30: 20 EC CA C8 CE A8 02 D0 1B
CA38: F7 20 EC CA E8 E4 FE D0 A5
CA40: F8 48 A9 04 8D A8 02 68 CF
CA48: 20 EC CA 88 CE A8 02 D0 F2
CA50: F7 20 EC CA E8 E0 28 D0 E2
CA58: F8 60 A2 14 A9 00 9D A7 57
CA60: 02 9D C0 02 CA 10 F7 A9 3F
CA68: 0C 8D BA 02 8D C3 02 8D 9F
CA70: B4 02 8D B9 02 8D AF 02 AF
CA78: A9 46 8D 0D D0 8D 0F D0 41
CA80: A9 50 8D 0C D0 A9 05 8D 21
CA88: 0E D0 A9 40 8D 10 D0 A9 69
CA90: 11 8D 1D D0 A9 D1 8D 15 3B
CA98: D0 A9 01 8D 27 D0 8D 28 4F
CAA0: D0 8D 2A D0 A9 00 8D 2B 5C
CAA8: D0 8D 2C D0 8D 2D D0 8D 1D
CAB0: 17 D0 A2 07 BD CD C8 9D 34
CAB8: F8 07 CA 10 F7 A9 84 8D 47
CAC0: 1C D0 A9 D2 8D 01 D0 A9 33
CAC8: E6 8D 09 D0 A9 A0 8D 00 EE
CAD0: D0 8D 08 D0 A9 06 8D 26 6B
CAD8: D0 8D 25 D0 A9 05 8D 2E 97
CAE0: D0 AD 11 D0 10 FB AD 1E 19
CAE8: D0 D0 F6 60 8D AA 02 8E AA
CAF0: AB 02 8C AC 02 48 8A 48 F4
CAF8: 98 A2 00 0A 48 8A 2A AA E5
CB00: 68 0A 48 8A 2A AA 68 0A 8C
CB08: 48 8A 2A AA 68 0A 48 8A F4
CB10: 2A AA 68 0A 48 8A 2A AA FE
CB18: 68 85 FB 86 FC 98 A2 00 C0
CB20: 0A 48 8A 2A AA 68 0A 48 8C
CB28: 8A 2A AA 68 0A 48 8A 2A F6
CB30: AA 68 18 65 FB 85 FB 8A C8
CB38: 65 FC 69 04 85 FC 68 A8 9B
CB40: 68 91 FB AD AA 02 AE AB EA
CB48: 02 AC AC 02 60 A9 33 85 68
CB50: FC A9 C0 85 FB A9 79 85 E1
CB58: FD A9 CB 85 FE A2 04 A0 97
CB60: 00 B1 FD 91 FB 88 D0 F9 F0
CB68: E6 FC E6 FE CA D0 F0 A0 5F
CB70: 40 B1 FD 91 FB 88 10 F9 80
CB78: 60 00 00 00 00 00 00 00 D8
CB80: 00 00 00 00 00 00 00 00 80
```

```
CB88: 01 00 80 02 00 40 04 00 50
CB90: 20 0F 3C F0 1D 7E B8 3A 7B
CB98: FF 5C 75 E7 AE EB FF D7 C4
CBA0: 9F E7 F9 9E 7E 79 FE 66 1E
CBA8: 7F 06 66 60 07 FF E0 00 DC
CBB0: 81 00 00 99 00 00 FF 00 CB
CBB8: 00 00 00 00 00 00 00 00 B8
CBC0: 00 00 00 00 00 00 00 00 C0
CBC8: 00 00 00 00 00 00 00 00 C8
CBD0: 00 00 38 00 00 6C 00 00 75
CBD8: 92 00 00 82 00 00 00 00 ED
CBE0: 00 00 00 00 00 00 00 00 E0
CBE8: 00 00 00 00 00 00 00 00 E8
CBF0: 00 00 00 00 00 00 00 00 F0
CBF8: 00 00 00 00 00 00 00 00 F8
CC00: 00 00 00 00 00 00 00 00 00
CC08: 00 00 00 00 00 00 00 7C 84
CC10: 00 00 C6 00 01 FF 00 03 DA
CC18: 55 80 06 FE C0 09 55 20 32
CC20: 0A 38 A0 0C 00 60 08 00 77
CC28: 20 00 00 00 00 00 00 00 48
CC30: 00 00 00 00 00 00 00 00 30
CC38: 00 00 00 00 00 00 00 00 38
CC40: 00 00 00 00 00 00 00 00 40
CC48: 01 FF 80 03 42 C0 06 BD 93
CC50: 60 0D 5A B0 1A 99 58 37 0C
CC58: FF EC 6E 99 76 DC 5A 3B 36
CC60: D8 3C 1B E0 00 07 C0 00 39
CC68: 03 C0 00 03 00 00 00 00 2F
CC70: 00 00 00 00 00 00 00 00 70
CC78: 00 00 00 00 00 00 00 00 78
CC80: 00 00 00 00 00 00 00 00 80
CC88: 00 00 00 00 28 00 00 BA 6B
CC90: 00 00 54 00 00 38 00 00 1D
CC98: 28 00 00 10 00 00 38 00 09
CCA0: 00 7C 00 00 00 00 00 00 1D
CCA8: 00 00 00 00 00 00 00 00 A8
CCB0: 00 00 00 00 00 00 00 00 B0
CCB8: 00 00 00 00 00 00 00 00 B8
CCC0: 00 00 00 00 00 00 24 00 E4
CCC8: 00 5A 00 00 7E 00 01 3C DE
CCD0: 80 03 18 C0 00 99 00 00 C6
CCD8: 7E 00 00 24 00 00 3C 00 B7
CCE0: 00 18 00 00 18 00 00 3C 4D
CCE8: 00 00 FF 00 00 00 00 00 E8
CCF0: 00 00 00 00 00 00 00 00 F0
CCF8: 00 00 22 00 00 7F 00 00 9A
CD00: C9 80 00 FF 80 04 7F 10 5E
CD08: 12 3E 24 0E 1C 38 03 1C FD
CD10: 60 01 FF C0 00 FF 80 00 B2
CD18: 41 00 00 7F 00 00 7F 00 58
CD20: 00 7F 00 00 1C 00 00 1C D7
CD28: 00 00 1C 00 00 3E 00 00 82
CD30: 7F 00 00 FF 80 07 FF F0 28
CD38: 00 00 00 00 00 FF 00 03 3B
CD40: FF C0 07 FF E0 0F FF F0 E8
CD48: 1F FF F8 1F FF F8 3F FF B7
CD50: FC 3F FF FC 3F FF FC 3F 05
CD58: FF FC 3F FF FC 3F FF FC CD
CD60: 1F FF F8 1F FF F8 0F FF 9F
CD68: F0 07 FF E0 03 FF C0 00 05
CD70: FF 00 00 00 00 00 00 00 70
CD78: 00 00 00 00 00 FF 00 03 7B
CD80: EA C0 0F BA A0 3E EA B0 70
CD88: 3E AA A8 3F EA EC 2F EB 4C
CD90: EC 2B BF EC 2A AE BC 2B 16
CD98: EA FC 2A AF BC 3A EE EC 2D
CDA0: 3A BA A8 3E BB A8 0F FA EA
CDA8: B0 0F AE A0 03 AA C0 00 26
CDB0: FF 00 00 00 00 00 00 00 B0
CDB8: 00 00 40 00 00 01 04 11 0F
CDC0: 20 00 00 08 11 00 80 80 FA
CDC8: 04 22 00 42 0C 84 00 C3 85
CDD0: 00 12 0C 80 00 C3 21 08 5C
CDD8: 30 80 42 CF 00 00 30 84 50
CDE0: 04 8C 00 02 32 01 10 00 B6
CDE8: 10 01 21 00 40 00 01 04 60
CDF0: 10 40 00 00 00 00 41 00 82
CDF8: 00 00 00 00 00 00 00 00 F8
CE00: 00 00 00 00 00 00 00 00 00
CE08: 00 00 00 00 00 00 00 00 08
CE10: 00 00 08 00 00 08 00 00 20
CE18: 08 00 00 08 00 00 00 00 28
CE20: 00 00 00 00 00 00 00 00 20
CE28: 00 00 00 00 00 00 00 00 28
CE30: 00 00 00 00 00 00 00 00 30
CE38: FF 00 00 00 00 00 00 00 38
CE40: 00 00 00 00 00 00 00 00 40
CE48: 00 00 00 01 00 80 02 00 CB
CE50: 40 04 00 20 0F 3C F0 1F 10
CE58: FF F8 3F FF FC 7F FF FE 0C
CE60: FF FF FF FF FF FF FF FF 60
CE68: FF FF FF FF 07 FF E0 07 57
CE70: FF E0 00 00 00 00 00 00 51
CE78: 00 00 00 00 00 00 00 00 78
CE80: 00 00 00 00 00 00 00 00 80
CE88: 00 00 00 00 00 00 00 00 88
CE90: 00 00 00 00 00 00 00 00 90
CE98: 00 00 00 00 00 00 00 00 98
CEA0: 00 00 00 00 00 00 00 00 A0
CEA8: 00 00 00 00 00 00 00 00 A8
CEB0: 00 00 07 FF C0 00 7C 00 F4
CEB8: 00 00 00 00 00 00 00 00 B8
CEC0: 00 00 00 00 00 00 00 00 C0
CEC8: 00 00 00 00 00 00 00 00 C8
CED0: 00 00 00 00 00 00 00 00 D0
CED8: 00 00 00 00 00 00 00 00 D8
CEE0: 00 00 00 00 00 00 00 00 E0
CEE8: 00 00 00 00 3F FF FC FF 25
CEF0: FF FF 3F FF FC 00 FF 00 2D
CEF8: 00 00 18 00 00 FF 00 03 14
CF00: 00 C0 06 00 60 08 00 10 3F
CF08: 10 81 08 10 00 08 20 24 FD
CF10: 04 20 18 04 E2 BD 47 E0 19
CF18: 18 07 20 24 04 20 00 04 A3
CF20: 10 81 08 10 00 08 0A 00 DB
```

**IMPORTANT!** Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 119 and 120 explain these codes and provide other essential information on entering *Ahoy!* programs. Refer to these pages **before** entering any programs!

```
CF28: 50 04 00 20 03 00 C0 00 60
CF30: FF 00 00 18 00 00 18 00 60
CF38: 00 FF FF FF FF FF FF FF 38
CF40: FF FF FF FF FF FF FF FF 40
CF48: FF FF FF FF FF FF FF FF 48
CF50: FF 00 00 00 00 00 00 00 50
CF58: 00 00 00 00 00 00 00 00 58
CF60: 00 00 00 00 00 00 00 00 60
CF68: 00 00 00 00 00 00 00 00 68
CF70: 00 00 00 00 00 00 00 00 70
CF78: 00 00 00 00 00 00 00 00 78
CF80: 00 00 00 00 00 00 00 00 80
CF88: 00 00 00 00 00 00 00 10 98
CF90: 00 00 64 00 01 A9 00 00 9F
CF98: 64 00 00 10 00 00 00 00 0D
CFA0: 00 00 00 00 00 00 00 00 A0
CFA8: 00 00 00 00 00 00 00 00 A8
CFB0: 00 00 00 00 00 00 00 00 B0
CFB8: FF 23 18 40 16 00 B2 00 FC
CFC0: 4C 01 25 3C 42 81 91 91 56
CFC8: 81 42 3C 2A 38 38 7C EE CE
CFD0: EE EE FE C6 18 FF 00 FF 8C
CFD8: 00 FF 00 FF 00 2E 00 00 07
CFE0: 00 08 00 00 00 00 3C 01 26
CFE8: 02 06 0B 18 26 69 9A 3E 7C
CFF0: 80 40 60 D0 18 64 96 59 4F
CFF8: 00 00 00 F8
```

# DELUXE LIST
## FROM PAGE 36

### DELUXE LIST 49152

```
·10 FOR ADD=49152TO49342:READN:CK=CK+N:PO
KEADD,N:NEXT                                  HP
·20 IF CK<>19399 THEN PRINT"ERROR IN DATA
 STATEMENTS[3"."]":STOP                       MJ
·30 PRINT"'SYS49152' TO TOGGLE DELUXE LIS
T"                                            OG
·40 SYS49152                                  KF
·50 END                                       IC
·60 DATA173,189,192,73,255,141,189,192,20
8,18                                          JN
·70 DATA169,26,141,6,3,169,167,141,7,3        DF
·80 DATA169,145,160,192,32,30,171,96,169,
51                                            FF
·90 DATA141,6,3,169,192,141,7,3,169,102       DE
·100 DATA160,192,32,30,171,169,0,141,190,
192                                           PI
·110 DATA96,141,188,192,201,34,208,8,173,
190                                           IL
·120 DATA192,73,255,141,190,192,173,188,1
92,201                                        EB
·130 DATA58,208,18,173,190,192,208,13,169
,13                                           NH
·140 DATA32,210,255,169,32,32,210,255,32,
210                                           PD
·150 DATA255,173,141,2,208,251,173,188,19
2,76                                          EF
·160 DATA26,167,68,69,76,85,88,69,32,76       NK
·170 DATA73,83,84,32,18,65,67,84,73,86        BK
·180 DATA65,84,69,68,146,45,68,79,32,78       OG
·190 DATA79,84,32,69,68,73,84,32,76,73        KD
·200 DATA78,69,83,13,0,68,69,76,85,88         IN
·210 DATA69,32,76,73,83,84,32,18,68,73        JJ
·220 DATA83,65,66,76,69,68,146,45,89,79       PD
·230 DATA85,32,77,65,89,32,69,68,73,84        DP
·240 DATA32,76,73,78,69,83,13,0,0,0           AD
·250 DATA0                                    LH
```

### DELUXE LIST 828

```
·10 FOR ADD=828TO1018:READN:CK=CK+N:POKEA
DD,N:NEXT                                     DD
·20 IF CK<>17851 THEN PRINT"ERROR IN DATA
 STATEMENTS[3"."]":STOP                       MA
·30 PRINT"'SYS828' TO TOGGLE DELUXE LIST"     OK
·40 SYS828                                    EF
·50 END                                       IC
·60 DATA173,249,3,73,255,141,249,3,208,18     NL
·70 DATA169,26,141,6,3,169,167,141,7,3        DF
·80 DATA169,205,160,3,32,30,171,96,169,11
1                                             FK
·90 DATA141,6,3,169,3,141,7,3,169,162         GO
·100 DATA160,3,32,30,171,169,0,141,250,3      JN
·110 DATA96,141,248,3,201,34,208,8,173,25
0                                             BD
·120 DATA3,73,255,141,250,3,173,248,3,201     HB
·130 DATA58,208,18,173,250,3,208,13,169,1
3                                             IK
·140 DATA32,210,255,169,32,32,210,255,32,
210                                           PD
·150 DATA255,173,141,2,208,251,173,248,3,
76                                            JK
·160 DATA26,167,68,69,76,85,88,69,32,76       NK
·170 DATA73,83,84,32,18,65,67,84,73,86        BK
·180 DATA65,84,69,68,146,45,68,79,32,78       OG
·190 DATA79,84,32,69,68,73,84,32,76,73        KD
·200 DATA78,69,83,13,0,68,69,76,85,88         IN
·210 DATA69,32,76,73,83,84,32,18,68,73        JJ
·220 DATA83,65,66,76,69,68,146,45,89,79       PD
·230 DATA85,32,77,65,89,32,69,68,73,84        DP
·240 DATA32,76,73,78,69,83,13,0,0,0           AD
·250 DATA0                                    LH
```

### AHOY! BBS GOES 1200 BAUD!

Effective immediately, the 24 hour a day *Ahoy!* Bulletin Board System can be accessed at 300 or 1200 baud, in 40 or 80 columns.

Set your modem for full duplex, no parity, 1 stop bit, 8-bit word length, and dial **718-383-8909**

# DETONATION
## FROM PAGE 56

**Beginning address in hex: C000**
**Ending address in hex: CB5F**
**SYS to start: 49152**
***Flankspeed* required for entry! See page 121.**

```
C000: 20 C3 C2 4C CB C5 A9 00 2E
C008: 8D B6 03 AD B7 03 8D FD 43
C010: 07 8D FE 07 8D FF 07 EE 2E
C018: B7 03 AD B7 03 C9 C8 D0 9E
C020: 05 A9 C4 8D B7 03 EA AD 74
C028: B9 03 D0 1B EE B8 03 AD 29
C030: B8 03 C9 AE D0 04 EE B9 E1
C038: 03 60 AD B8 03 8D 0B D0 6E
C040: CE 0D D0 EE 0E D0 60 CE E9
C048: B8 03 AD B8 03 C9 6A D0 72
C050: 04 CE B9 03 60 AD B8 03 A9
C058: 8D 0B D0 EE 0D D0 CE 0E 6B
C060: D0 60 AD E7 03 C9 06 B0 AA
C068: 03 4C 81 C0 A9 00 8D E7 19
C070: 03 AD F8 07 C9 C9 F0 06 AB
C078: EE F8 07 4C 81 C0 CE F8 BD
C080: 07 AD 00 DC 29 08 D0 2A 3E
C088: EE E7 03 AD 10 D0 29 01 1B
C090: D0 16 E6 FB A5 FB C9 FF C5
C098: D0 18 E6 FB 18 AD 10 D0 0B
C0A0: 69 01 8D 10 D0 4C B2 C0 39
C0A8: E6 FB A5 FB C9 39 D0 02 03
C0B0: C6 FB AD 00 DC 29 04 D0 FB
C0B8: 2C EE E7 03 AD 10 D0 29 76
C0C0: 01 D0 0D C6 FB A5 FB C9 CD
C0C8: 1D D0 1A E6 FB 4C E5 C0 A6
C0D0: C6 FB A5 FB C9 00 D0 0D DC
C0D8: 38 AD 10 D0 E9 01 8D 10 28
C0E0: D0 A9 FF 85 FB AD 00 DC 67
C0E8: 29 02 D0 0D EE E7 03 E6 B2
C0F0: FC A5 FC C9 DD D0 02 C6 D1
C0F8: FC AD 00 DC 29 01 D0 0D 88
C100: EE E7 03 C6 FC A5 FC C9 0A
C108: 33 D0 02 E6 FC A5 FB 8D 21
C110: 00 D0 A5 FC 8D 01 D0 20 03
C118: 8E C6 EA CE BC 02 AD BC 50
C120: 02 D0 26 A9 20 8D 04 D4 49
C128: A9 01 8D BC 02 CE BE 02 AE
C130: AD BE 02 D0 14 EE BD 02 32
C138: AE BD 02 E0 1F D0 1A A2 34
C140: FF 8E BD 02 A9 01 8D BE 85
C148: 02 A9 00 8D C5 02 EE C5 FD
C150: 02 AD C5 02 C9 05 D0 F6 5E
C158: 60 A9 21 8D 04 D4 BD DD 85
C160: C9 8D 00 D4 BD FD C9 8D 9F
C168: 01 D4 BD 1D CA 8D BC 02 30
C170: 18 6D BC 02 8D BE 02 4C 4F
C178: 49 C1 E6 FD A5 FD C9 0B E0
C180: D0 07 20 06 C0 A9 00 85 6E
C188: FD 20 62 C0 EA EA AD CA 18
C190: 03 20 B8 C1 A9 80 8D 12 F7
C198: D4 A2 00 E8 E0 00 D0 FB A6
C1A0: AD CB 03 20 B8 C1 A9 81 E2
C1A8: 8D 12 D4 20 DE FF 8E CF 7A
C1B0: 03 E0 01 B0 0A 4C 3D C2 9C
C1B8: 8D E7 07 60 EA EA EA AD 04
C1C0: B9 C1 8D CE C1 AD BA C1 84
C1C8: 8D CF C1 A9 20 8D 06 04 49
C1D0: EA EA EA AD C6 03 C9 6B 3E
C1D8: D0 03 4C C2 C4 AD C6 03 F7
C1E0: AA BD 3E CA 8D B9 C1 BD 19
C1E8: AA CA 8D BA C1 EE C6 03 21
C1F0: AD B9 C1 C9 27 D0 0A A9 8F
C1F8: 25 8D CA 03 A9 26 8D CB A2
C200: 03 AD B9 C1 C9 00 D0 0A D0
C208: A9 27 8D CA 03 A9 28 8D 93
C210: CB 03 AD B9 C1 C9 C0 D0 63
C218: 0A A9 29 8D CA 03 A9 2A 24
C220: 8D CB 03 AD B9 C1 C9 D3 43
C228: D0 0A A9 23 8D CA 03 A9 D4
C230: 24 8D CB 03 A9 00 A2 00 FC
C238: A0 00 20 DB FF AD 1E D0 71
C240: C9 00 F0 08 A9 00 8D 1E 58
C248: D0 4C BF C1 AD 1F D0 C9 4E
C250: 00 F0 03 20 63 C2 AD C0 F8
C258: 03 C9 03 D0 03 20 60 C4 41
C260: 4C 7A C1 AD 01 D0 C9 64 96
C268: B0 13 AD A7 02 D0 28 A9 26
C270: 20 8D 63 04 EE A7 02 EE 0D
C278: C0 03 4C A8 C2 AD 10 D0 82
C280: C9 45 D0 14 AD A8 02 D0 9D
C288: 0E A9 20 8D 04 06 EE A8 8F
C290: 02 EE C0 03 4C A8 C2 60 5D
C298: AD A9 02 D0 FA A9 20 8D 15
C2A0: E3 05 EE A9 02 EE C0 03 D6
C2A8: A9 41 8D 04 D4 8D 00 D4 5C
C2B0: A0 14 20 8E C6 8C 01 D4 3D
C2B8: 88 C0 00 D0 F5 A9 00 8D FF
C2C0: 1F D0 60 AD 0E DC 29 FE D1
C2C8: 8D 0E DC A5 01 29 FB 85 92
C2D0: 01 A2 00 BD 00 D0 9D 00 A0
C2D8: 38 E8 E0 00 D0 F5 A2 00 44
C2E0: BD 00 D1 9D 00 39 E8 E0 11
C2E8: 00 D0 F5 A2 00 BD 65 C9 3F
C2F0: 9D 18 39 E8 E0 50 D0 F5 C0
C2F8: A2 00 BD B5 C9 9D D8 38 87
C300: E8 E0 28 D0 F5 A5 01 09 68
C308: 04 85 01 AD 0E DC 09 01 35
C310: 8D 0E DC 18 AD 18 D0 29 60
C318: F0 69 0E 8D 18 D0 A2 00 99
C320: BD AE C6 9D 00 D0 E8 E0 8B
C328: 2F D0 F5 A2 00 BD DD C6 23
C330: 9D F8 07 E8 E0 08 D0 F5 66
C338: A2 00 BD E5 C6 9D 00 30 13
C340: E8 E0 00 D0 F5 A2 00 BD 31
C348: E5 C7 9D 00 31 E8 E0 00 8E
C350: D0 F5 A2 00 BD E5 C8 9D C3
C358: 00 32 E8 E0 80 D0 F5 A2 3E
```

```
C360: 00 BD 15 CB 9D 00 D4 E8 5A
C368: E0 19 D0 F5 A9 00 8D B9 1A
C370: 03 8D B6 03 8D E7 03 8D C0
C378: C0 03 8D C6 03 8D CF 03 F3
C380: 8D BC 02 8D BD 02 8D BE 66
C388: 02 8D C5 02 AD 00 D0 85 E3
C390: FB AD 01 D0 85 FC A9 6A A2
C398: 8D B8 03 A9 C4 8D B7 03 98
C3A0: A9 E7 8D B9 C1 A9 07 8D 79
C3A8: BA C1 A9 1C 8D FE 02 20 99
C3B0: D2 FF A9 93 20 D2 FF A9 5D
C3B8: 00 8D FF 02 AD FF 02 AA A2
C3C0: BD 3E CA 8D D0 C3 BD AA 12
C3C8: CA 8D D1 C3 AD FE 02 8D F2
C3D0: D3 07 EE FF 02 AD D0 C3 DE
C3D8: C9 4F D0 03 EE FE 02 AD 63
C3E0: D0 C3 C9 27 D0 05 A9 1B 01
C3E8: 8D FE 02 AD D0 C3 C9 01 84
C3F0: D0 05 A9 1E 8D FE 02 AD CA
C3F8: D0 C3 C9 00 D0 05 A9 1C F2
C400: 8D FE 02 AD D0 C3 C9 98 33
C408: D0 05 A9 1F 8D FE 02 AD E2
C410: D0 C3 C9 C0 D0 05 A9 1B C9
C418: 8D FE 02 AD D0 C3 C9 D2 85
C420: D0 05 A9 2C 8D FE 02 AD 08
C428: D0 C3 C9 D3 D0 03 4C 34 AE
C430: C4 4C BC C3 A9 23 8D CA E6
C438: 03 A9 24 8D CB 03 A9 03 12
C440: 20 D2 FF A9 2B 8D 63 04 FC
C448: 8D E3 05 8D 04 06 A9 00 FF
C450: 8D C1 03 8D 1F D0 A9 DC A6
C458: 8D 93 C4 8D 98 C4 60 EA 74
C460: A5 FB C9 A0 B0 01 60 A5 24
C468: FB C9 AF 90 01 60 A5 FC 72
C470: C9 CF B0 01 60 A5 FC C9 88
C478: D7 90 01 60 A9 00 8D A7 21
C480: 02 8D A8 02 8D A9 02 8D 81
C488: C0 03 EE 93 C4 EE 98 C4 DF
C490: A9 2B 8D DC 07 A9 08 8D 16
C498: DC DB EE C1 03 AD C1 03 77
C4A0: C9 0B D0 03 4C 43 C6 CE 6E
C4A8: 7F C1 A2 1F DE 1D CA CA 3D
C4B0: E0 FF D0 F8 A9 2B 8D 63 21
C4B8: 04 8D E3 05 8D 04 06 4C 17
C4C0: 7A C1 A9 00 8D C9 03 A9 AA
C4C8: C0 8D C2 03 A9 81 8D 12 A7
C4D0: D4 A9 93 20 D2 FF 20 8E 84
C4D8: C6 A2 00 DE 01 D0 E8 E8 C4
C4E0: E0 10 D0 F7 CE 02 D0 CE 0B
C4E8: 0A D0 CE 04 D0 EE 0C D0 33
C4F0: AD 09 D0 8D 21 D0 8D 0F 94
C4F8: D4 A2 00 AD C2 03 9D F9 7B
C500: 07 E8 E0 04 D0 F8 EE C2 50
C508: 03 AD C2 03 C9 C4 D0 05 E2
C510: A9 C0 8D C2 03 EE C9 03 89
C518: AD C9 03 C9 DC D0 03 4C 59
C520: 25 C5 4C D6 C4 A9 00 8D 2A
C528: 15 D0 AD C9 03 8D 21 D0 08
C530: 8D 20 D0 8D 0F D4 20 8E CE
C538: C6 CE C9 03 AD C9 03 C9 DE
C540: 00 D0 E7 20 8E C6 8D 18 14
C548: D4 A2 00 BD 2E CB 9D C7 DC
C550: 05 A9 06 9D C7 D9 E8 E0 0E
C558: 0A D0 F0 A2 00 BD 38 CB 88
C560: 9D 17 06 A9 02 9D 17 DA 56
C568: E8 E0 0A D0 F0 AD 00 DC 88
C570: 29 10 D0 F9 A9 00 8D A7 53
C578: 02 8D A8 02 8D A9 02 A2 8E
C580: 00 BD 5A CB 9D C7 05 9D 6C
C588: 17 06 E8 E0 0A D0 F2 A2 DF
C590: 00 BD A7 C5 9D 1D CA E8 2A
C598: E0 20 D0 F5 A9 0B 8D 7F 22
C5A0: C1 20 C3 C2 4C 7A C1 19 AA
C5A8: 19 12 0E 0E 19 12 12 12 3F
C5B0: 12 0E 0E 0E 0E 19 15 0E 37
C5B8: 15 0E 15 0E 0E 0E 0E 0E 37
C5C0: 19 19 12 0E 0E 19 19 EA 3E
C5C8: EA EA EA A2 00 BD 4E CB 04
C5D0: 9D C7 05 A9 0D 9D C7 D9 31
C5D8: E8 E0 0A D0 F0 AD 58 CB 40
C5E0: 8D F3 05 AD 59 CB 8D F4 BC
C5E8: 05 A2 00 BD 42 CB 9D 16 10
C5F0: 06 A9 05 9D 16 DA E8 E0 FD
C5F8: 0C D0 F0 A2 00 BD 38 CB 2B
C600: 9D 67 06 A9 01 9D 67 DA 95
C608: E8 E0 0A D0 F0 EA AD 00 36
C610: DC 29 10 F0 09 20 1B C1 1D
C618: 20 8E C6 4C 0E C6 A2 00 51
C620: AD 5A CB 9D C6 05 9D EE E9
C628: 05 9D 16 06 9D 66 06 E8 D9
C630: E0 0C D0 EC A9 00 8D A7 B9
C638: 02 8D A8 02 8D A9 02 4C F7
C640: 7A C1 EA A2 00 BD A2 C6 31
C648: 9D 9E 05 A9 04 9D 9E D9 4D
C650: E8 E0 0C D0 F0 EE C6 03 A0
C658: AD C6 03 C9 6D D0 03 4C 27
C660: 81 C6 AD A6 05 C9 39 F0 F5
C668: 06 EE A6 05 4C 55 C6 A9 1B
C670: 30 8D A6 05 AD A5 05 C9 FB
C678: 39 F0 06 EE A5 05 4C 55 E3
C680: C6 A9 DC 8D 93 C4 8D 98 D9
C688: C4 A9 00 4C 46 C5 A9 00 F8
C690: 8D F2 03 EE F2 03 AD F2 99
C698: 03 C9 00 D0 F6 60 EA EA 63
C6A0: EA EA 13 03 0F 12 05 20 D2
C6A8: 20 30 30 30 30 30 A6 D2 33
C6B0: 21 85 21 85 9B 3B 9B D3 44
C6B8: 50 6A 06 AE 85 5A 44 1B 67
C6C0: 00 00 00 FF C8 1E 1F 00 C6
C6C8: 00 00 00 1E 00 00 00 00 E6
C6D0: 00 00 00 00 00 0D 06 06 E9
C6D8: 06 01 07 07 07 C8 C0 C1 40
C6E0: C2 C3 C4 C4 C4 FF FF FC B2
C6E8: C0 00 0C C0 00 00 C0 00 37
C6F0: 00 C0 00 00 C0 00 00 C0 33
C6F8: 00 00 C0 00 00 C0 00 00 7A
```

```
C700: C0 00 00 C0 00 00 C0 00 42
C708: 00 C0 00 00 C0 00 00 C0 4A
C710: 00 00 C0 00 0C FF FF FC D9
C718: 00 00 00 00 00 00 00 00 18
C720: 00 00 00 00 00 FF FF FC 1D
C728: C0 00 0C 00 00 0C 00 00 01
C730: 0C 00 00 0C 00 00 0C 00 54
C738: 00 0C 00 00 0C 00 00 0C 5C
C740: 00 00 0C 00 00 0C 00 00 58
C748: 0C 00 00 0C 00 00 0C 00 6C
C750: 00 0C C0 00 0C FF FF FC 26
C758: 00 00 00 00 00 00 00 00 58
C760: 00 00 00 00 00 FF FF FF 60
C768: C0 00 03 C0 00 03 C0 00 B0
C770: 03 C0 00 03 C0 00 03 C0 BB
C778: 00 03 C0 00 03 C0 00 03 03
C780: C0 00 03 C0 00 03 C0 00 C8
C788: 03 C0 00 03 C0 00 03 F0 04
C790: 00 0F 00 00 00 00 00 00 9F
C798: 00 00 00 00 00 00 00 00 98
C7A0: 00 00 00 00 00 F0 00 0F A0
C7A8: C0 00 03 C0 00 03 C0 00 F0
C7B0: 03 C0 00 03 C0 00 03 C0 FB
C7B8: 00 03 C0 00 03 C0 00 03 43
C7C0: C0 00 03 C0 00 03 C0 00 09
C7C8: 03 C0 00 03 C0 00 03 FF 53
C7D0: FF FF 00 00 00 00 00 00 D0
C7D8: 00 00 00 00 00 00 00 00 D8
C7E0: 00 00 00 00 00 00 00 00 E0
C7E8: 00 00 00 01 FF 00 03 01 ED
C7F0: 80 06 00 C0 0C 00 60 18 BC
C7F8: 00 30 00 7C 30 00 C6 30 CC
C800: 01 86 30 01 8C 30 01 80 F6
C808: 60 00 C0 C0 00 7F 80 00 E9
C810: 00 00 00 00 00 00 00 00 10
C818: 00 00 00 00 00 00 00 00 18
C820: 00 00 00 00 00 00 00 00 20
C828: 00 00 00 00 00 40 00 00 68
C830: 60 00 00 30 00 00 18 00 D8
C838: 7C 0C 00 C6 0C 01 83 0C 24
C840: 03 01 0C 03 1B 0C 03 0E 8B
C848: 0C 03 00 18 01 80 30 00 21
C850: C0 60 00 3F C0 00 00 00 71
C858: 00 00 00 00 00 00 00 00 58
C860: 00 00 00 00 00 00 00 00 60
C868: 00 00 00 00 00 00 00 00 68
C870: 00 00 00 00 00 00 00 00 70
C878: 00 00 00 FF 00 01 81 80 7B
C880: 03 00 C0 06 18 C0 06 30 59
C888: C0 06 31 80 06 1F 00 06 2C
C890: 00 0C 03 00 18 01 80 30 69
C898: 00 C0 60 00 7F C0 00 00 F9
C8A0: 00 00 00 00 00 00 00 00 A0
C8A8: 00 00 00 00 00 00 00 00 A8
C8B0: 00 00 00 00 03 FC 00 06 B6
C8B8: 03 00 0C 01 80 18 00 C0 22
C8C0: 30 70 C0 30 D8 C0 30 80 9C
C8C8: C0 30 C1 80 30 63 00 30 BF
C8D0: 3E 00 18 00 00 0C 00 00 33
C8D8: 06 00 00 02 00 00 00 00 E0
C8E0: 00 00 00 00 00 00 00 00 E0
C8E8: 00 00 00 00 00 00 00 00 E8
C8F0: 00 00 00 00 00 00 00 00 F0
C8F8: 00 00 00 00 00 00 10 00 09
C900: 00 54 00 00 54 00 00 10 B8
C908: 00 00 38 00 00 FE 00 01 40
C910: 7D 00 06 7D 80 00 7C 00 0E
C918: 00 7C 00 00 44 00 00 24 FC
C920: 00 00 36 00 00 00 00 00 56
C928: 00 00 00 00 00 00 00 00 28
C930: 00 00 00 00 00 00 00 00 30
C938: 00 00 00 00 00 00 10 00 48
C940: 00 54 00 00 54 00 00 10 F8
C948: 00 00 38 00 00 FE 00 01 80
C950: 7D 00 03 7C C0 00 7C 00 8A
C958: 00 7C 00 00 44 00 00 44 5D
C960: 00 00 C6 00 00 18 18 18 6F
C968: 18 18 24 4A 91 18 18 18 E0
C970: 18 3C 5A A5 00 00 07 08 D3
C978: F5 F2 08 07 00 00 0C 10 8C
C980: E4 E8 10 0C 00 89 52 24 6A
C988: 18 18 18 18 18 00 A5 5A 01
C990: 3C 18 18 18 18 00 E0 10 1E
C998: BF 5F 10 E0 00 00 30 08 E0
C9A0: 27 17 08 30 00 18 18 7E C5
C9A8: FF FF FF FF 7E 18 18 18 6F
C9B0: F8 F8 00 00 00 00 00 00 A2
C9B8: FF FF 00 00 00 18 18 18 01
C9C0: 18 18 18 18 18 00 00 00 39
C9C8: F8 F8 18 18 18 00 00 00 03
C9D0: 1F 1F 18 18 18 18 18 18 9F
C9D8: 1F 1F 00 00 00 47 B4 47 5A
C9E0: 47 47 F4 47 47 ED ED 47 16
C9E8: 47 47 47 ED E9 0C E9 0C 98
C9F0: E9 0C E9 0C 47 ED 47 B4 0E
C9F8: 47 47 47 F4 F4 05 04 05 C6
CA00: 05 05 03 05 05 05 05 06 27
CA08: 06 06 06 05 07 07 07 07 3B
CA10: 07 07 07 07 06 05 05 04 40
CA18: 05 05 05 03 03 19 19 12 71
CA20: 0E 0E 19 12 12 12 12 0E AB
CA28: 0E 0E 0E 19 15 0E 15 0E B1
CA30: 15 0E 0E 0E 0E 0E 19 19 BD
CA38: 12 0E 0E 19 19 5A E7 BF 9A
CA40: 97 6F 47 1F F7 CF A7 7F 9C
CA48: 57 2F 07 DF B7 8F 67 3F A3
CA50: 17 EF C7 9F 77 4F 27 26 D2
CA58: 25 24 23 22 21 20 1F 1E 65
CA60: 1D 1C 1B 1A 19 18 17 16 2D
CA68: 15 14 13 12 11 10 0F 0E F4
CA70: 0D 0C 0B 0A 09 08 07 06 BC
CA78: 05 04 03 02 01 00 28 50 FF
CA80: 78 A0 C8 F0 18 40 68 90 A4
CA88: B8 E0 08 30 58 80 A8 D0 AC
CA90: F8 20 48 70 98 C0 C1 C2 40
CA98: C3 C4 C5 C6 C7 C8 C9 CA D2
```

```
CAA0: CB CC CD CE CF D0 D1 D2 1B     CB00: 07 07 07 07 07 07 07 07 38
CAA8: D3 00 07 07 07 07 07 07 A6     CB08: 07 07 07 07 07 07 07 07 40
CAB0: 06 06 06 06 06 06 06 05 DF     CB10: 07 07 07 07 07 00 00 00 33
CAB8: 05 05 05 05 05 04 04 04 DD     CB18: 14 20 0A 0A 00 00 00 00 60
CAC0: 04 04 04 04 04 04 04 04 E0     CB20: 00 00 00 0A 01 00 00 80 AB
CAC8: 04 04 04 04 04 04 04 04 E8     CB28: 01 FA 00 00 00 0F 07 01 3B
CAD0: 04 04 04 04 04 04 04 04 F0     CB30: 0D 05 20 20 0F 16 05 12 BE
CAD8: 04 04 04 04 04 04 04 04 F8     CB38: 10 12 05 13 13 20 06 09 B4
CAE0: 04 04 04 04 04 04 04 04 01     CB40: 12 05 02 0F 02 20 02 0C 98
CAE8: 04 04 04 04 04 04 04 04 09     CB48: 01 03 0B 0D 05 12 04 05 84
CAF0: 05 05 05 05 05 05 06 06 1B     CB50: 14 0F 0E 01 14 09 0F 0E BC
CAF8: 06 06 06 06 06 07 07 07 2C     CB58: 02 19 20 00 FF 00 FF 00 93
```

## SCUTTLEBUTT

*Continued from page 14*

will be made available for popular sampling units at a later date.)

MIDImouse Music, 503-622-5451 (see address list, page 14).

### DELUXEPAINT ADD-ONS

Two new EA programs for use with *DeluxePaint*, each $99.95:

The *DeluxePaint* color printing program has 15 formats for creating a variety of greeting cards, banners, and the like. An unlimited number of images can be placed on the page, edited, flipped, shrunk or expanded, and changed in color. All 11 Amiga fonts plus 3 sizes and 3 styles are supported, for a total of 99 text types. Two sets of large character are useful for banners and posters.

*DeluxeVideo* allows owners of a 512K Amiga and a VCR to create video presentations for business, education, or entertainment use. The video editor includes 27 special effects like wipes, fades, and dissolves, 3-D axis rotation for titles, strobes, and multiframe animation, plus zoom, shrink, disappear, move, and color cycle. An onscreen remote controller provides 12 commands including fast forward/reverse, single step, and cycle repeat.

A library of images is included; or, drawings from *DeluxePaint* or other IFF-compatible graphics packages can be animated in any sequence or speed. Music scores and digitized sound effects like crashes, booms, and screeches are provided.

Electronic Arts, 415-571-7171 (see address list, page 14).

### HANDWRITING ANALYZER

*Handwriting Analyzer* ($19.95) utilizes various well-known theories to generate a page-long analysis of a writer, based on the C-64 user's answers to 20 questions concerning a writing sample of 300 words or more. Available on disk or tape.

CTL Software, 408-263-1623 (see address list, page 14).

### QUANTUMLINK ADDITIONS

The latest new services on QuantumLink include a GEOS forum (Q & A sessions with the program's developers, conferences on applications, news on latest developments and software), a Photo Gallery (converts subscriber photographs into computer programs for downloading), and RockLink (news on top stars, music review board, rock library, and monthly guests). Additionally, the Mall has been expanded to include a live auction.

QuantumLink, 800-392-8200 or 703-448-8700 (see address list, page 14).

### FOUR MORE

*Four More for the 64* ($9.95), a second disk of programs from AC3L Software, includes *TV Align* (checks colors, sound, etc.), *Treasure Map* (treasure searching game), *Find It* (locates words in hidden word puzzles), and *Trivia* (500 questions for 1-6 players or teams). PA residents must add 6% sales tax.

AC3L Software (see address list, page 14).

### BBS SYSTEM

The *Syntech BBS Construction Set* ($49.95), a C-64 bulletin board system, includes an editor with onscreen formatting and wordwrap, 12-hour clock and day of the week calendar, printer dump option, up to 25 subboards with rotating, self-maintaining message base, 11 customizable status levels, remote operation, and other features.

KIRA Corporation, 215-683-5699 (see address list, page 14).

## ...COMING IN THE DECEMBER ISSUE OF *AHOY!* (ON SALE NOVEMBER 4)...

**THE FILE MANIPULATOR**
THE VIRTUES OF RELATIVE FILES

FALL KICKOFF!
**FOOTBALL PROGRAMS**
FOR THE 64

**CHRISTMAS PRESENTS FOR YOUR COMPUTER**
IT'S BETTER TO GIVE *AND* RECEIVE!

# IF YOU CAN FIND A BETTER C128 PROGRAM WE'LL BUY IT FOR YOU!*




## WORD WRITER 128 with Thesaurus

**An 80-column professional word processing system for home and business use. You get:**

- **An 85,000 word Spelling Checker**
- **An Integrated Thesaurus** with thousands of synonyms
- **A built-in, 5-function calculator**
- **On-Screen Highlighting** displays underlining, **boldface** and *italics* – as you write.
- **Headers and Footers**
- **Superscript and Subscript**
- **An Outliner Processor** that quickly organizes facts and ideas in outline format.

## DATA MANAGER 128 with Report Writer

**A complete general information storage and retrieval system with report writing, graphics, statistics, and label making capabilities. Plus, you get:**

- **Exclusive X-SEARCH, X-SORT, and X-CHART** features that allow you to cross-search any category of information; sort items alphabetically, numerically, or by date; break down statistical information into categories; and graphically view your results.
- **On-Screen Tutorial**
- **Large Capacity Record Size** includes up to 64 pages (4,096 characters) per record.

## SWIFTCALC 128 with Super Graphics

**A powerful, easy-to-use electronic spreadsheet designed especially for home and business use:**

- **Super Graphics** display and print out numerical information using pie charts, vertical bar charts, scatter diagrams, line graphs, 3-D staggered bar charts.
- **Sideways** prints all your columns on one continuous sheet . . . sideways.
- **250 rows and up to 250 columns** provide up to 62,500 cells (locations) in which to place information
- **Performs mathematical and financial analysis functions.**
- **Speed Keys** • **SwiftSort** • **SwiftDOS**

**With Timeworks you get more than software. . .**

***You Get Our Customer Technical Support Team*** – free to all registered users.

**With Timeworks you get our Money Back Guarantee***
If you can find anything that works better for you – and it's available – we'll buy it for you. Details inside every Timeworks package.**

***You Get Our Liberal Upgrade and Exchange Policy*** – Details are inside every Timeworks package.

TIMEWORKS®

*More power for your dollar*

Timeworks, Inc., 444 Lake Cook Road, Deerfield, Illinois 60015
312-948-9200

**For the Commodore 128™ Computer*****

Suggested Retail List Price:
**$69.95 each**

**Available now at your favorite dealer, or call Timeworks**

**TO ORDER CALL:**
**1-800-535-9497**

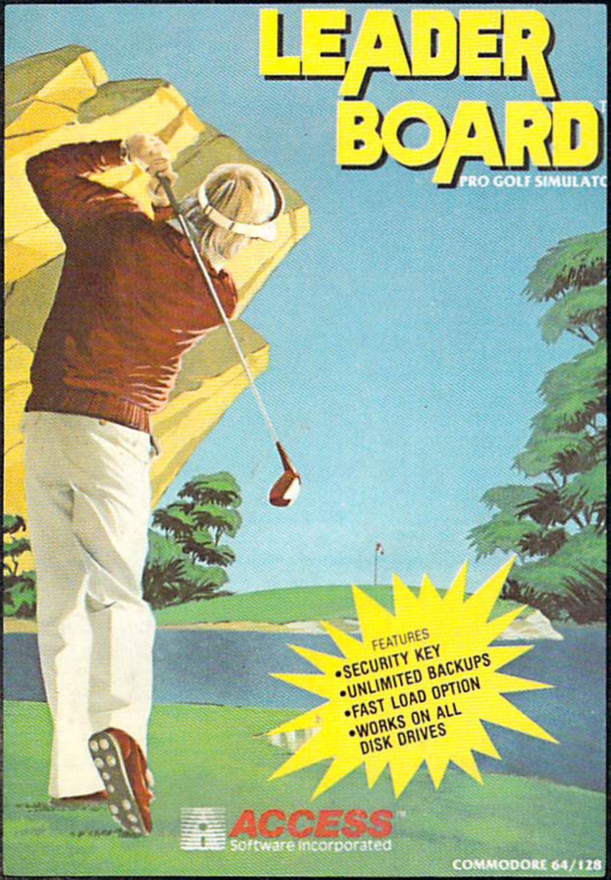
**Reader Service No. 167**

**These Programs INTERFACE with Each Other**

** Offer expires 90 days after date of original purchase.
*** COMMODORE 128 is a trademark of Commodore Electronics, Ltd.

© 1983 **Timeworks**, Inc. All Rights Reserved.

# TWO EXCITING SPORTS SIMULATORS FROM ACCESS!

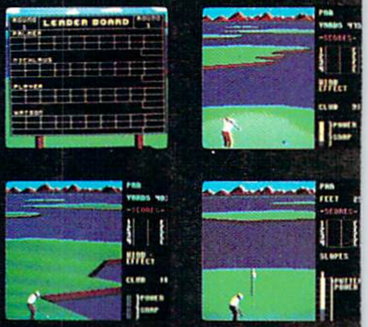


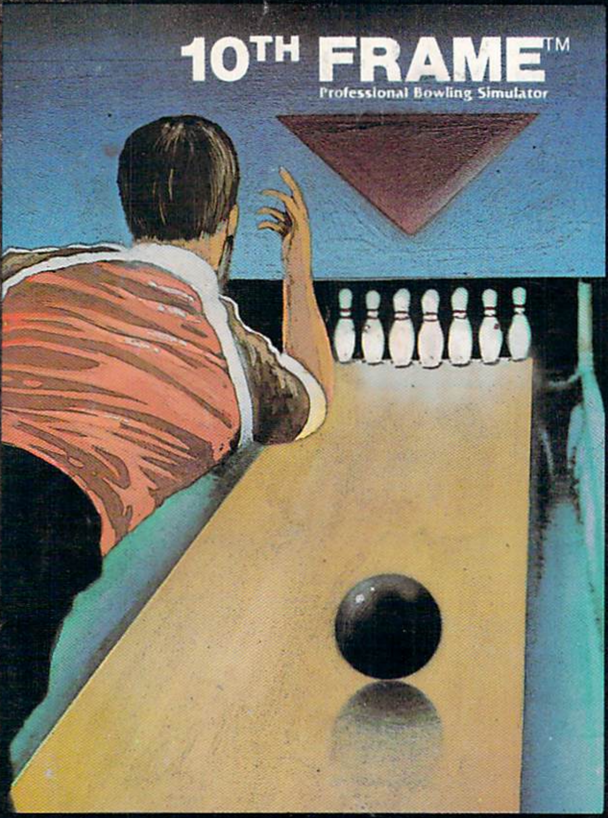

## LEADER BOARD™

**"Pro Golf Simulator"**
**Bruce & Roger Carver**

Access welcomes you to the exciting world of professional golf with **LEADER BOARD.** Featuring amazing realistic 3-D animation, golfers will face multiple 18-hole courses that demand strategy, total concentration and control to come in under par. **LEADER BOARD** is the most realistic golf game available because it is accually a simulator that gives you a true perspective view of your golf game. Features include:

- 1 to 4 Players
- Choice of Club, Distance, Type of Shot (hook, slice, putting) and More
- Realistic Sound
- Joystick Controlled
- Multiple 18-Hole Golf Courses
- Automatic Scoring
- Disk: Commodore 128/64, Amiga, Atari 520ST, Atari 8 BIT
- Practice Driving Range
- Suggested Retail Price $39.95






**NEW!**

## 10TH FRAME™

**The Professional Bowling Simulator**
**By Bruce & Roger Carver**

Put on your shoes and get ready to roll with 10th Frame. Featuring outstanding graphics and true perspective view, 10th frame captures the look and "feel" of real bowling and sets a new standard of excellence for computer based sport simulation. Features include:

- Up to eight different players including league play.
- Multiple levels of play.
- Outstanding sound and pin action
- Joystick controlled
- Automatic scoring
- Suggested retail price $39.95
- Available for Commodore 128/64

### Attention Dealers!

If you wish to be included on our dealer list for new product information and special promotional material, please call 1-(800) 824-2549

ACCESS™ Software Incorporated
Reader Service No. 166

If you can't find our products at your local dealer you can order direct.
For mail orders, enclose check or money order, plus $1.00 shipping and handling, and specify machine version desired. Order by phone on VISA, Master Charge or C.O.D. by calling (801) 298-9077.
ACCESS SOFTWARE, INC. 2561 South 1560 West
Woods Cross, UT 84087